VPDES PERMIT FACT SHEET

This document gives the pertinent information concerning the reissuance of the VPDES permit listed below. This permit is being processed as a minor municipal permit. The effluent limitations contained in this permit will maintain the Water Quality Standards of 9 VAC 25-260-00 et seq. The discharge results from domestic sewage from Windy Gap Elementary School treated by a 0.006 MGD fixed film activated sludge system with UV disinfection. This permit action consists of reducing the monitoring frequency for BOD_5, TSS, and ammonia (Jan. – May); adding temperature monitoring; and revising the special conditions. (SIC Code: 4952)

1. **Facility Name and Address:**
   Windy Gap Elementary School WWTP
   250 School Service Road
   Rocky Mount, VA 24151
   Location: 465 Truman Hill Road, Hardy, Virginia

2. **Permit No: VA0090719** Current Permit Expiration Date: July 6, 2016

3. **Owner and Operator Contacts:**
   Darryl Spencer, Supervisor of Buildings and Grounds, (540) 483-5538;
   darryl.spencer@franklincounty.gov
   Ruthie Dooley, Operator, Oasis Water Company, (540) 297-2396; 50bmg632@hughes.net

4. **Application Complete Date:** December 17, 2015
   Permit Drafted By: Becky L. France, Water Permit Writer
   Date: December 8, 2015 (Revised 12/11/15)
   DEQ Regional Office: Blue Ridge Regional Office
   Reviewed By: Kevin Crider, Water Permit Writer
   Date Reviewed: January 27, 2016
   Public Comment Period Dates: From 1/9/16 To 2/8/16

5. **Receiving Stream Classification:**

Receiving Stream:	North Fork Gills Creek (River Mile: 0.8)		
Watershed:	VAW-L11R (Gills Creek Watershed)		
River Basin:	Roanoke River		
River Subbasin:	Roanoke River		
Section:	6a		
Class:	III		
Special Standards:	NEW-1		
7-Day, 10-Year Low Flow:	0.10 MGD	7-Day, 10-Year High Flow:	0.42 MGD
1-Day, 10-Year Low Flow:	0.08 MGD	1-Day, 10-Year High Flow:	0.37 MGD
30-Day, 5-Year Low Flow:	0.22 MGD	Harmonic Mean Flow:	0.79 MGD
Tidal:	No	303(d) Listed:	No*

   (Fecal coliform Total Maximum Daily Load developed for Gills Creek Watershed)
   (**Attachment A** contains a copy of the flow frequency determination memorandum.)

6. **Operator License Requirements:** IV

7. **Reliability Class:** I

8. **Permit Characterization**:

( ) Private ( ) Interim Limits in Other Document
( ) Federal ( ) Possible Interstate Effect
( ) State
(X) POTW
( ) PVOTW

9. **Wastewater Treatment System:** A description of the wastewater treatment system is provided below. See **Attachment B** for wastewater treatment schematics and **Attachment C** for a copy of the site visit report. Treatment units associated with the discharge are listed in the table below.

Table I
DISCHARGE DESCRIPTION

Outfall Number	Discharge Source	Treatment (Unit by Unit)	Flow (Design) (MGD)
001	Windy Gap Elementary School WWTP	grease trap bar screen flow equalization basin emergency overflow storage tank denitrification tank fixed film aeration/ Bio-Wheel basin sludge holding tank membrane filter tank UV disinfection chamber	0.006

This wastewater treatment works serves an elementary school with cafeteria. The treatment system consists of a 0.006 MGD fixed film activated sludge treatment system. Wastewater from the cafeteria is initially routed through a grease trap. Wastewater from the grease trap and the rest of the facility flows through a mechanical bar screen prior to flow equalization. Wastewater from the flow equalization tank is routed to a fixed film activated sludge unit with a separate denitrification unit. The wastewater then flows into a tank with membrane filter where solids are removed. The sludge is routed to a sludge holding tank. Following ultraviolet (UV) disinfection, the effluent is discharged to a pipe that leads to an unnamed tributary of the North Fork of Gills Creek.

10. **Sewage Sludge Use or Disposal:** A VPDES Sewage Sludge Permit Application Form was submitted for this facility to address disposal of sewage sludge from the wastewater treatment facility. Sludge is periodically transported to the Martinsville City STP (VA0025305).

11. **Discharge Location Description:** A USGS topographic map which indicates the proposed discharge location, any significant dischargers, any water intakes, and other items of interest is included in **Attachment D**. The latitude and longitude of the proposed discharge is N 37^0 09'52", E 79^{0}51'45".

Name of Topo: Hardy Number: 079A

12. **Material Storage:** Soda ash for pH adjustment is stored in a building onsite.

13. **Ambient Water Quality Information:** Memoranda or other information which helped to develop permit conditions (special water quality studies, STORET data, and any other biological and/or chemical data, etc.) are listed below.

Flow Frequencies
Several flow measurements were taken on Gills Creek just above the Route 122 bridge near Burnt Chimney, Virginia from 1981 to 1984. Also, flow records are available from a continuous record gauge on the Pigg River near Sandy Level, Virginia. The flow frequencies from the reference gauge were plotted on a regression line and the associated flow frequencies at the measurement site were determined from the graph. The flow frequencies for the discharge point were determined using proportional drainage areas. There were slight increases in the low flow frequencies from the previous permit term. See **Attachment A** for a summary of the flow frequencies.

Receiving Stream Water Quality Data
No chemical monitoring data have been collected on the North Fork of Gills Creek. Background temperature, pH, and hardness data were available from STORET Station 4AGIL023.22. This station is located on the main stem of Gills Creek at the Route 657 bridge which is upstream of the confluence with the North Fork of Gills Creek. The 90th percentile pH and temperature values were derived from data collected from 1999 through 2010. **Attachment E** contains these STORET data.

The permittee discharges into the Gills Creek Watershed (VAW-L11R). A Total Maximum Daily Load (TMDL) for fecal coliform has been developed for Gills Creek. Refer to **Attachment E** for an excerpt from the EPA approved report which characterizes impairment in the Gills Creek watershed.

14. **Antidegradation Review and Comments**: Tier 1 _____ Tier 2 __X___ Tier 3 _____

The State Water Control Board's Water Quality Standards include an antidegradation policy (9 VAC 25-260-30). All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water

bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters. The antidegradation review begins with Tier determination. The North Fork of Gills Creek in this segment (VAW-L11R) is not listed on Part I of the 303(d) list for exceedances of water quality criteria. The North Fork of Gills Creek is determined to be a Tier 2 water, and no significant degradation of existing quality is allowed. This determination is based on the fact that there are no data to indicate that this water is not better than the standards for all parameters that the Board has adopted criteria.

For purposes of aquatic life protection in Tier 2 waters, "significant degradation" means that no more than 25 percent of the difference between the acute and chronic aquatic criteria values and the existing quality (unused assimilative capacity) may be allocated. For purposes of human health protection, "significant degradation" means that no more than 10 percent of the difference between the human health criteria and the existing quality (unused assimilative capacity) may be allocated. The antidegradation baseline for aquatic life and human health are calculated for each pollutant as follows:

Antidegradation baseline (aquatic life) = 0.25 (WQS – existing quality) + existing quality

Antidegradation baseline (human health) = 0.10 (WQS – existing quality) + existing quality

Where:
"WQS" = Numeric criterion listed in 9 VAC 25-260-5 et seq. for the parameter analyzed
"Existing quality" = Concentration of the parameter being analyzed in the receiving stream

These "antidegradation baselines" become the new water quality criteria in Tier 2 waters and effluent limits for future expansions or new facilities must be written to maintain the antidegradation baselines for each pollutant. Antidegradation baselines have been calculated as described above and included in **Attachment G**. The facility began operation in 2012. Antidegradation guidelines are applicable and have been applied to this permit reissuance.

Water quality based effluent limits for pH, ammonia, and total residual chlorine (TRC) have been established in compliance with antidegradation requirements set forth in 9 VAC 25-260-30 of the water quality standards regulations. In accordance with antidegradation policy, pH will be maintained within the range of 6.0 S.U. and 9.0 S.U. The ammonia and TRC (if applicable) limitations for the discharge have been established to prevent any significant lowering of water quality and identify the quality that must be maintained by the current proposal as well as future proposals.

15. **Site Inspection:** Date: 10/15/15 Performed by: Becky L. France
Attachment C contains a copy of the site visit memorandum. The last compliance inspection was performed on October 28, 2014 by Chad H. Williams.

16. **Effluent Screening and Limitation Development:** DEQ Guidance Memo 00-2011 was used in developing all water quality based limits pursuant to water quality standards (9 VAC 25-260-5 et seq). **Attachment E** contains stream data and **Attachment F** contains effluent data used to

calculate the 90th percentile values for pH and temperature. Refer to **Attachment G** for the antidegradation wasteload allocation spreadsheet and effluent limit calculations, and **Attachment H** for the regional water quality model output. See **Table II** on page 16 for a summary of limits and monitoring requirements. Since the treatment works may potentially not have a discharge when the school year is not in session, effluent limitations have been established as per period of discharge (once per discharge day etc.).

A. **Mixing Zone**

The MIXER program was run to determine the percentage of the receiving stream flow that could be used in the antidegradation wasteload allocation calculations. The program output indicated that 100 percent of the 7Q10 and 100 percent of 1Q10 may be used for calculating acute and chronic antidegradation wasteload allocations (AWLAs). A copy of the print out from the MIXER run is enclosed in **Attachment G**.

B. **Effluent Limitations for Conventional Pollutants**

Flow -- The permitted design flow of 0.006 MGD for this facility is taken from the application for the reissuance. The treatment facility is currently operating significantly below its design capacity. In accordance with the current VPDES Permit Manual, flow is to be estimated and recorded per discharge day.

pH -- Between August 2011 and August 2015 there were no exceedances of the pH limitations (**Attachment F**). The pH limits of 6.0 S.U. minimum and 9.0 S.U. maximum are required. These limits are based upon the water quality criteria in 9 VAC 25-260-50 for Class III receiving waters and are in accordance with federal technology-based guidelines, 40 CFR Part 133, for secondary treatment. Grab samples shall be collected once per discharge day.

Biochemical Oxygen Demand (BOD_5), Dissolved Oxygen (DO) – Between August 2011 and August 2015 there were no exceedances of the BOD_5 or DO limitations (**Attachment F**). Since there has been a slight increase in the flow frequencies at the outfall, the new data have been entered into the Regional Water Quality Model for Free Flowing Streams (Version 4.0) to reassess the BOD_5 limits.

A 1,000 foot stream segment following the discharge was evaluated to determine if more stringent BOD_5, total kjeldahl nitrogen (TKN), or dissolved oxygen (DO) limits were needed to comply with water quality standards and prevent antidegradation to this Tier 2 water. To comply with antidegradation criteria for DO, TKN, and BOD_5, no significant lowering of DO is allowed. Significant lowering is defined as more than 0.2 mg/L from the existing level (90 percent DO saturation value).

A copy of the model output results is found in **Attachment H**. An initial DO of 5.0 mg/L, a TKN of 20 mg/L, and a BOD_5 of 30 mg/L were used in the model input. The

model predicted a DO sag at the initial discharge point to 7.299 mg/L. The initial drop of 0.099 mg/L from the baseline complies with antidegradation policy.

The BOD_5 limits are technology-based requirements for municipal dischargers with secondary treatment. The BOD_5 of 30 mg/L (680 g/d) monthly average and 45 mg/L (1000 g/d) weekly average have been continued. The monitoring data for BOD_5 were significantly below the limitations so the monitoring frequency has been reduced from 1/month to 1/6 months. See **Attachment I** for a summary of discharge data and a discussion of reduced monitoring.

The minimum dissolved oxygen limit of 5.0 mg/L has also been continued from the previous permit. Dissolved oxygen will continue to be monitored once per discharge day via grab samples.

Total Suspended Solids (TSS) – Between August 2011 and August 2015 there were no exceedances of the TSS limitations. The TSS limits are based upon secondary treatment standards as mandated by the federal technology-based guidelines (40 CR Part 133.102). Effluent limits of 30 mg/L (680 g/d) monthly average and 45 mg/L (1000 g/d) weekly average have been continued for TSS. Samples shall continue to be collected as grabs. The monitoring data for TSS were significantly below the limitations so the monitoring frequency has been reduced from 1/month to 1/6 months. See **Attachment I** for a summary of discharge data and a discussion of reduced monitoring.

Total Phosphorus, Total Nitrogen -- In accordance with the revised Water Quality Standards (9 VAC 25-260-00 et seq.) adopted by the Board in December 1997, this proposed discharge is into a stream segment that has been classified as nutrient enriched. The receiving stream, the North Fork of Gills Creek, flows into the main stem of Gills Creek and then into Smith Mountain Lake. The Policy on Nutrient Enriched Water (9 VAC 25-40-10 et seq.) requires effluent limitations on total phosphorus for all discharges permitted after July 1, 1988, with a flow greater than 0.05 MGD. The facility has a design flow of 0.006 MGD, so no phosphorus permit limitations have been imposed.

The Policy also allows for the implementation of monitoring requirements if it has been determined that there is the potential to discharge a monthly average total phosphorus concentration greater than or equal to 2 mg/L or a monthly average total nitrogen concentration greater than or equal to 10 mg/L. Since the discharge is into nutrient enriched waters, a previous permit required effluent total nitrogen and phosphorus data which the permittee collected from 2008 to 2009. A summary of the nutrient data is included in **Attachment F**.

No additional nitrogen or phosphorus monitoring will be required with this reissuance. Water quality standards are being developed for total nitrogen and phosphorus. Should this facility be subject to nutrient criteria, the permit may be reopened to include nutrient limitations.

E. coli -- Revised Water Quality Standards became effective on February 1, 2010, and included updates to the bacteria and disinfection policy in 9 VAC 25-260-170. The water quality criteria of 126 colony forming units (cfu)/100 mL (geometric average) and 235 cfu/100 mL (single sample maximum) have been applied at the end of the discharge pipe. The Water Quality Standards, 9 VAC 25-260-170, have been revised to indicate that the geometric mean "shall be calculated using all data collected during any calendar month with a minimum of four weekly samples. If there are insufficient data to calculate a monthly geometric mean..., no more than 10% of the total samples in the assessment period shall exceed 235 *E. coli* cfu/100 mL. "

The limits of 126 cfu/100 mL monthly average and 235 cfu/100 mL maximum have been continued from the previous permit. If fewer than four weekly samples are collected during a discharge month, a single sample maximum limit of 235 cfu/100 mL applies. Grab samples shall be collected once per discharge week between 8 AM and 4 PM. The permit also includes a special condition (Part I.C) describing these reporting requirements.

A bacteria Total Maximum Daily Load (TMDL) has been developed for the Gills Creek Watershed. A wasteload allocation of 1.04E +10 cfu/year has been assigned to this discharge. See **Attachment** E for the revised Gills Creek watershed TMDL (1.37E+11 cfu/year) which was calculated based upon a geometric mean *E. coli* limit of 126 cfu/100 mL, a future growth factor, and a design flow of 0.006 MGD for Windy Gap Elementary School WWTP.

Temperature – Daily temperature monitoring is being required in the reissued permit. These data will be reported as a maximum daily average for the purposes of calculating the 90th percentile effluent temperature and calibrating the Regional Water Quality Model. The 90th percentile temperature is used in the AWLA spreadsheet calculations. The temperature water quality criteria as per 9 VAC 25-260-50 for this Class III receiving stream is 20 °C.

C. **Effluent Limitations for Toxic Pollutants**

Ammonia as Nitrogen – During the permit term there was one exceedance of the ammonia limits in January 2013 (26 mg/L). This exceedance occurred during a period when the effluent temperature dropped below 10 ° C, so the high ammonia concentration is a result of the limitations of the treatment technology during low temperatures not an indication of poor treatment plant operation.

The permit stream flow frequencies and effluent pH and temperature data have changed. So, the ammonia limit has been reevaluated with the new data. The 90th percentile temperature and pH data from STORET monitoring station 4AGIL023.22 on Gills Creek (**Attachment E**) and effluent pH and temperature data reported on the facility's Discharge Monitoring Reports and bench sheets (**Attachment F**), were used to determine the antidegradation wasteload allocations (AWLAs). **Attachment G** contains

the spreadsheet used to calculate the AWLAs and the results of the reasonable potential determination for ammonia (STATS program). As recommended in Guidance Memo 00-2011, a default ammonia concentration of 9 mg/L was input into the program.

The acute and chronic AWLAs for ammonia were input into the agency STATS program together with one datum value of 9 mg/L. The STATS program determined that for the months of June through December, limits of 9.5 mg/L monthly average and 9.5 mg/L weekly average are needed. These limits and the monitoring frequency of 1/month via grab samples shall be continued from the previous permit.

The STATS program determined that for the months of January through May no ammonia limits are needed. However, the Clean Water Act prohibits backsliding on these ammonia water quality based limits where the change is due to a change in the regulation or its applications. So, the old limits of 15 mg/L monthly average and 15 mg/L weekly average for January through May have been continued. The limit is based on chronic conditions rather acute condition. The short term low temperature conditions occurred during February 2013 when the permit exceedance occurred. Backsliding on the limit is not allowed but reducing the monitoring frequency to 1/3 months can be justified to verify compliance with the limit. Since there are only five months associated with this limit, the only compliance data due date for the Discharge Monitoring Report will be June 10th of each year. Monitoring shall continue to be conducted via grab sampling.

Total Residual Chlorine (TRC) -- The facility uses ultraviolet as the disinfection method. In the event that the permittee decides to use TRC as an alternative method of disinfection, TRC limits have been established to avoid any future modifications to the permit. In the absence of TRC data, one data value, equal to the QL, was assumed to exist. This methodology is similar to that discussed in Guidance Memo 00-2011 for ammonia. Antidegradation wasteload allocations (AWLAs) have been established for TRC to protect the receiving stream from degradation. Since no data exist for the Tier II receiving stream, the baseline is equal to 25 percent of the criterion.

The acute and chronic AWLAs for TRC were input into the STATS program to calculate appropriate limits. Based on the Agency's STATS program, permit limits of 0.032 mg/L monthly average and 0.038 mg/L weekly average are required. These limits will continue from the previous permit. Grab samples are required once per discharge day. See **Attachment G** for the AWLA spreadsheet and STATS program output.

17. **Basis for Sludge Use and Disposal Requirements:** The sludge from the treatment facility is periodically transported to the City of Martinsville WWTP. There are no limits or monitoring requirements associated with sludge use or disposal beyond compliance with the Sludge Management Plan approved with the reissuance of the permit.

18. **Antibacksliding Statement:** Since there are no limits less stringent than the previous permit, the permit limits comply with the antibacksliding requirements of 9 VAC 25-31-220 L of the VPDES Permit Regulations.

19. **Compliance Schedules:** For this reissuance, there are no compliance schedules.

20. **Special Conditions:** A brief rationale for each special condition contained in the permit is given below.

A. **Total Residual Chlorine (TRC) Limitations and Monitoring Requirements (Part I.B)**

Rationale: Should the permittee elect to disinfect by chlorine rather than UV, this condition establishes TRC concentration limits after chlorine contact and final TRC effluent limits and monitoring requirements. This condition is required by Sewage Collection and Treatment Regulations, 9 VAC 25-790, bacteria standards. Also, 40 CFR 122.41(e) requires the permittee, at all times, to properly operate and maintain all facilities and systems of treatment in order to comply with the permit. These requirements ensure proper operation of chlorination equipment to maintain adequate disinfection.

B. ***E. coli*** **Reporting Requirements (Part I.C)**

Rationale: The Water Quality Standards, 9 VAC 25-260-170 establishes bacteria water quality standards. The standard set bacteria monitoring requirements. This special condition is needed to describe requirements for when there is insufficient data (four weekly samples) to calculate a monthly geometric mean.

C. **95% Capacity Reopener (Part I.D.1)**

Rationale: This condition requires that the permittee address problems resulting from high influent flows, in a timely fashion, to avoid non-compliance and water quality problems from plant overloading. This requirement is contained in 9 VAC 25-31-200 B4 of the VPDES Permit Regulation and applies to all POTWs and PVOTWs.

D. **CTC, CTO Requirement (Part I.D.2)**

Rationale: This condition is required by the Code of Virginia § 62.1-44.19 and Sewage Collection and Treatment Regulations, 9 VAC 25-790.

E. **Operations and Maintenance Manual Requirement (Part I.D.3)**

Rationale: An Operations and Maintenance Manual is required by the Code of Virginia § 62.1-44.19; the Sewage Collection and Treatment Regulations, 9 VAC 25-790; and 9 VAC 25-31-190 E of the VPDES Permit Regulation.

F. **Licensed Operator Requirement (Part I.D.4)**

Rationale: The VPDES Permit Regulation, 9 VAC 25-31-200 C; the Code of Virginia § 54.1-2300 et seq., Board for Waterworks and Wastewater Works Operators and Onsite Sewage System Professionals Regulations (18 VAC 160-20-10 et seq.) require licensure of operators. A Class IV operator is required for this facility.

G. **Reliability Class (Part I.D.5)**

Rationale: Reliability class designations are required by Sewage Collection and Treatment Regulations, 9 VAC 25-790 for all municipal facilities. Facilities are required to achieve a certain level of reliability to protect water quality and public health in the event of component or system failure. A Reliability Class II has been assigned to this facility.

H. **Closure Plan (Part I.D.6)**

Rationale: This condition establishes the requirement to submit a closure plan for the treatment works if the treatment facility is being replaced or expected to close. A closure plan is necessary to ensure treatment works are properly closed so that the risk of untreated wastewater discharge, spills, leaks, and exposure to raw materials is eliminated and water quality is maintained. The Code of Virginia § 62.1-44.21 requires every owner to furnish when requested plans, specifications, and other pertinent information as may be necessary to determine the effect of the wastes from this discharge on the quality of state waters, or such other information as may be necessary to accomplish the purpose of the State Water Control Law.

I. **Nutrient Enriched Waters Reopener (Part I.D.7)**

Rationale: Policy for Nutrient Enriched Waters, 9 VAC 25-40-10 allows reopening of permits for discharges into waters designated as nutrient enriched if total phosphorus and total nitrogen in a discharge potentially exceeds specified concentrations. The policy anticipates that future phosphorus and nitrogen limits may be needed.

J. **Sludge Reopener (Part I.D.8)**

Rationale: This condition is required by VPDES Permit Regulation, 9 VAC 25-31-220 C for all permits issued to treatment works treating domestic sewage to allow incorporation of any applicable standard for sewage sludge use or disposal promulgated under Section 405(d) of the Clean Water Act.

K. **Sludge Use and Disposal (Part I.D.9)**

Rationale: VPDES Permit Regulation, 9 VAC 25-31-100 P; 220 B2; and 420 and 720, and 40 CFR Part 503 require all treatment works treating domestic sewage to submit

information on sludge use and disposal practices and to meet specified standards for sludge use and disposal.

L. **Total Maximum Daily Load (TMDL) Reopener (Part I.D.10)**

Rationale: Section 303(d) of the Clean Water Act requires that Total Maximum Daily Loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The reopener recognizes that, according to Section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed it they are the result of a TMDL, basin plan, or other wasteload allocation prepared under Section 303 of the Act.

M. **Compliance Reporting (Part I.D.11)**

Rationale: In accordance with VPDES Permit Regulation, 9 VAC 25-31-190 J4 and 220 I, DEQ is authorized to establish monitoring methods and procedures to compile and analyze data on water quality. This condition is necessary when toxic pollutants are monitored by the permittee and a maximum level of quantification and/or specific analytical method is required in order to assess compliance with a permit limit or to compare effluent quality with a numeric criterion. This condition also establishes protocols for calculation of reported values.

N. **Effluent Monitoring Frequencies (Part I.D.12)**

Rationale: Permittees are granted a reduction in monitoring frequency based on a history of permit compliance. To remain eligible for the reduction, the permittee should not have violations related to the effluent limits for which reduced frequencies were granted. If the permittee fails to maintain the previous level of performance, the baseline monitoring frequency should be reinstated for those parameters that were previously granted a monitoring frequency reduction.

O. **Permit Application Requirement (Part I.D.13)**

Rationale: VPDES Permit Regulation, 9 VAC 25-31-100 D and 40 CFR 122.21(d)(1) require submission of a new application at least 180 days prior to expiration of the existing permit. In addition, the VPDES Permit Regulation, 9 VAC 25-31-100 E1 and 40 CFR 122.21(e)(1) note that a permit shall not be issued before receiving a complete application.

P. **Conditions Applicable to All VPDES Permits (Part II)**

Rationale: VPDES Permit Regulation, 9 VAC 25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed.

21. **Changes to the Permit:**

A. **The following special condition has been added to the permit:**

1. An Effluent Monitoring Frequencies Special Condition (Part I.D.12) has been added to require that the permittee revert back to previous monitoring frequencies if they are issued a Notice of Violation as a result of a permit limit violation.

2. A Permit Application Requirement Special Condition (Part I.D.13) has been added to provide the specific due date for the required submittal of the application.

B. **Special conditions that have been modified from the previous permit are listed below: (The referenced permit sections are for the new permit.)**

1. The Chlorine Limitations and Monitoring Requirements Special Condition (Part I.B) has been modified to reflect changes in the Water Quality Standards.

2. The Operations and Maintenance Manual Requirement Special Condition (Part I.D.4) has been modified to reflect current VPDES Permit Manual recommendations.

3. The Compliance Reporting Special Condition (Part I.D.11) has been modified to reflect a change in the quantification level for BOD_5.

B. **Permit Limits and Monitoring Requirements: Table III** on page 17 summarizes changes to permit limits and monitoring requirements.

22. **Variances/Alternate Limits or Conditions:** No variances or alternate limits or conditions are included in this permit. A waiver request for Form 2A application monitoring of fecal coliform was submitted by the permittee. The request was granted because application monitoring for fecal coliform is not necessary because *E. coli* is the bacteria parameter for the Virginia Water Quality Standards and the permit requires that the facility monitor for *E. coli*. The permittee requested that BOD_5 and TSS data collected during the permit term be used in lieu of the application requirement for 24-hour composite samples. These items were not considered necessary to the permit reissuance. Therefore, these waivers were granted.

23. **Regulation of Treatment Works Users:** There are no industrial users contributing to the treatment works. VPDES Permit Regulation 9 VAC 25-31-280 B9 requires that every permit issued to a treatment works owned by a person other than a state or municipality provide an explanation of the Board's decision on the regulation of users. The treatment works at Windy Gap Elementary School is municipally owned. Additionally, there are no industrial users contributing to the facility. Therefore, this regulation does not apply.

24. **Public Notice Information required by 9 VAC 25-31-280 B:**

All pertinent information is on file and may be inspected, and arrangements made for copying by contacting Becky L. France at:

Virginia Department of Environmental Quality
Blue Ridge Regional Office
3019 Peters Creek Road
Roanoke, VA 24019
(540) 562-6700
becky.france.deq.virginia.gov

Persons may comment in writing or by e-mail to the DEQ on the proposed permit action and may request a public hearing during the comment period. Comments shall include the name, address, and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for the comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state (1) the reason why a hearing is requested; (2) a brief informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and (3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing.

Due notice of any public hearing will be given. The public may review the draft permit and application at the Blue Ridge Regional Office in Roanoke by appointment. A copy of the public notice is found in **Attachment J**.

25. **303(d) Listed Segments (TMDL):** This facility discharges directly to the North Fork of Gills Creek. The stream segment receiving the effluent is not listed on the current 303(d) list. However, the discharge is located in Gills Creek Watershed, and a Total Maximum Daily Load (TMDL) was developed for fecal coliform and approved by EPA on May 31, 2002 and the State Water Control Board on June 17, 2004. The TMDL report indicates that the impact of the facility discharge on fecal coliform levels is considered negligible. On June 2, 2011, EPA approved an amendment to the Gills Creek TMDL to include future growth, base the TMDL on *E. coli*, and base the calculations on a design capacity of 0.006 MGD rather than 0.004 MGD. The revised *E. coli* Gills Creek TMDL is 1.37E+11 cfu/year. The *E. coli* WLA for the Windy Gap Elementary School WWTP discharge is 1.04E +10 cfu/year. This permit has *E. coli* limits of 126 cfu/100 mL monthly average and 235 cfu/100 mL maximum that are in compliance with this revised TMDL. **Attachment E** contains an excerpt from the TMDL report, TMDL memos, and revised EPA TMDL approval.

26. **Additional Comments**

Reduced Monitoring: In accordance with Guidance Memo 98-2005, all permit applications received after May 4, 1998, are considered for reduction in effluent monitoring frequency. Only facilities having exemplary operations that consistently meet permit requirements may qualify for reduced monitoring. To qualify for consideration of reduced monitoring requirements, the facility should not have been issued any Warning Letters or Notices of Violation (NOV), or be under any Consent Orders, Consent Decrees, Executive Compliance Agreements, or related enforcement documents during the past three years.

The facility received a Warning Letter (W2013-03-W-1005) for exceedance of the ammonia limits in January 2013. During the time the ammonia sample was collected the effluent temperature had fallen to 7 ^{0}C. Nitrification would not be expected below 10 ^{0}C. So, this value does not represent an excursion from the expected performance from the treatment plant. The exceedance is due to the weather and beyond the control of the permittee. Additionally, these conditions were short term and the ammonia limit was based upon chronic conditions. With the exception of this weather related exceedance, there have been no other exceedances of the ammonia limit from October 2009 through October 2015. Within the limits of the treatment technology, it is believed that the permittee has operated the plant in an exemplary manner and the one exceedance was not within their control. Therefore, this facility qualifies for evaluation of reduced monitoring. See **Attachment I** for a compilation of effluent data and a discussion of reduced monitoring.

A. **Previous Board Action:** None

B. **Staff Comments:** The discharge is not controversial. The discharge is in conformance with the existing planning documents for the area. The Virginia Department of Health reviewed the application and found no apparent impacts to waterworks sources as a result of the permit. The EPA Checksheet was completed for the previous reissuance.

C. **Public Comment:** No comments were received during the public comment period.

D. **Tables**

Table I	Discharge Description (Page 2)
Table II	Basis for Monitoring Requirements (Page 16)
Table III	Permit Processing Change Sheet (Page 17)

E. **Attachments**

A. Flow Frequency Memorandum
B. Wastewater Treatment Diagrams
C. Site Visit Report

D. USGS Topographic Map
E. Ambient Water Quality Information
- STORET DATA Station (4AGIL023.22)
- Fecal Coliform TMDL for Gills Creek (Excerpt)
- Gills Creek TMDL Revision Memos

F. Effluent Data
G. Wasteload and Limit Calculations
- Mixing Zone Calculations (MIXER 2.1)
- Antidegradation Wasteload Allocation Spreadsheet
- STATS Program Results (ammonia, TRC)

H. Regional Water Quality Model (Version 4.0)
I. Reduced Monitoring Evaluation Memorandum
J. Public Notice

Table II
BASIS FOR LIMITATIONS

OUTFALL: 001
DESIGN FLOW: 0.006 MGD

( ) Interim Limitations
(x) Final Limitations

Effective Dates - From: Effective Date
To: Expiration Date

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITS				MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	1/D-Day	Estimate
pH (Standard Units)	1, 3	NA	6.0	NA	9.0	1/D-Day	Grab
BOD_5	1	30 mg/L 680 g/d	45 mg/L 1000 g/d	NA	NA	1/6 Months	Grab
Dissolved Oxygen	3,4	NA	NA	5.0 mg/L	NA	1/D-Day	Grab
Total Suspended Solids	1	30 mg/L 680 g/d	45 mg/L 1000 g/d	NA	NA	1/6 Months	Grab
E. coli	3,5	126 N / 100 mL (Geometric Mean)	NA	NA	235 N/100 mL	1/D-Week	Grab
Ammonia as Nitrogen (January - May)	3	15 mg/L	15 mg/L	NA	NA	1/3 Months	Grab
Ammonia as Nitrogen (June - December)	3	9.5 mg/L	9.5 mg/L	NA	NA	1/D-Month	Grab
Temperature	3,4	NA	NA	NA	NL ^{o}C	1/Day	IS

1/D-Month = 1/Discharge Month NA = Not Applicable NL = No Limitations, monitoring only
1/D-Week = 1/Discharge Week 1/D-Day = 1/Discharge Day IS = Immersion Stabilization

The basis for the limitations codes are:

1. Federal Effluent Guidelines: (Secondary Treatment Requirement)
2. Best Professional Judgment
3. Water Quality Criteria
4. Water Quality Model
5. Total Maximum Daily Load (Gills Creek)

Table III
PERMIT PROCESSING CHANGE SHEET

LIMITS AND MONITORING SCHEDULE:

Outfall No.	Parameter Changed	Monitoring Requirement Changed		Effluent Limits Changed		Reason for Change	Date
		From	To	From	To		
001	TSS	1/discharge-month	1/6 months			Based on the TSS data submitted during the permit term, the permittee qualifies for a reduction in monitoring frequency.	12/4/15
001	BOD_5	1/discharge-month	1/6 months			Based on the BOD_5 data submitted during the permit term, the permittee qualifies for a reduction in monitoring frequency.	12/4/15
001	Ammonia as Nitrogen (Jan. – May)	1/discharge-month	1/3 months			STATS program output indicates a limit is not needed and backsliding on this water quality based limit is not allowed. However, monitoring frequency can be reduced to verify compliance with limit.	12/4/15
001	Temperature	NA	1/discharge-day	NA	NL °C daily max	Temperature monitoring has been added to provide data for calculation of the 90th percentile temperature to be used in the Regional Water Quality Model.	12/4/15

Attachment A

Flow Frequency Memorandum

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
3019 Peters Creek Road, Roanoke, Virginia 24019

SUBJECT: Flow Frequency Determination
Windy Gap Elementary School WWTP – (VA0090719)

TO: Permit File

FROM: Becky L. France, Water Permit Writer BLF

DATE: October 1, 2015 (Revised 12/11/15)

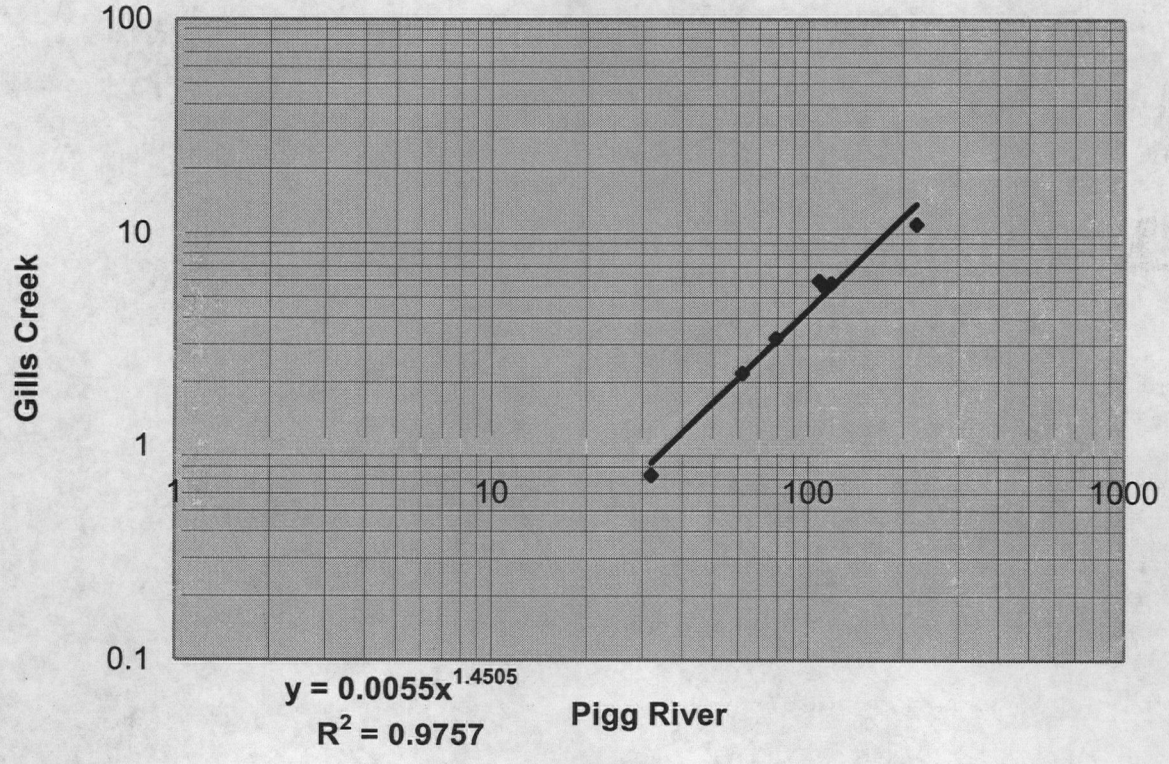
This memorandum supersedes the September 17, 2010 memorandum concerning the subject VPDES permit.

Windy Gap Elementary School WWTP discharges to the North Fork of Gills Creek near Red Valley, Virginia. Based upon a field stream assessment conducted on January 19, 2007, the stream is deemed to be perennial. Stream flow frequencies are required at this site to develop effluent limitations for the VPDES permit.

The USGS conducted several flow measurements on the Gills Creek from 1981 to 1984. The measurements were made just above the Route 122 bridge near Burnt Chimney, VA. The measurements correlated very well with the same day daily mean values from the continuous record gauge on the Pigg River near Sandy Level, VA #02058400. The measurements and daily mean values were plotted on a logarithmic graph and a best fit line was drawn through the data points. The required flow frequencies from the reference gauge were plotted on the regression line and the associated flow frequencies at the measurement site were determined from the graph. The flow frequencies for the discharge point and the confluence with the North Fork of Gills Creek were determined using proportional drainage areas. This analysis assumes there are no significant discharges, withdrawals, or springs influencing the flow in the North Fork of Gills Creek upstream of the discharge point. The high flows are January through May. Flow frequencies for the reference gauge, the measurement site, and the discharge pointed are listed on the attached tables.

Flow Data (cfs)

Date	Pigg	Gills
8/25/1981	32	0.73
9/21/1981	79	3.2
10/22/1981	62	2.2
7/22/1982	118	5.8
10/21/1982	108	5.98
8/4/1983	113	5.54
8/22/1984	220	11



Pigg		Above Outfall (Gills)	
cfs	Flow Freq	cfs	MGD
42	1Q10	1.244	0.804
47	7Q10	1.465	0.947
83	30Q5	3.342	2.160
123	HF 1Q10	5.912	3.821
134	HF 7Q10	6.695	4.327
209	HM	12.757	8.244
65	30Q10	2.344	1.515
171	HQ 30Q10	9.535	6.162
350 mi^2	DA	21.85 mi^2	

Low flow months Jan-May
DA = drainage area

Reference Gauge (data from 1963 to 2003)
Pigg River at Rocky Mount, VA (#02056900)

	Drainage Area [mi^2] =		350	mi^2	
	ft^3/s	MGD		ft^3/s	MGD
1Q10 =	44.8	6	High Flow 1Q10 =	123	22
7Q10 =	49.9	8	High Flow 7Q10 =	134	52
30Q5 =	86.4	15	High Flow 30Q10=	171	59
30Q10=	66.7	12	HM =	209	74

Flow frequencies from Regression Analysis
Gills Creek above Route 122, near Burnt Chimney, VA (#02057050)

	Drainage Area [mi^2] =		21.85	mi^2	
	ft^3/s	MGD		ft^3/s	MGD
1Q10 =	1.37	0.88	High Flow 1Q10 =	5.91	3.82
7Q10 =	1.60	1.03	High Flow 7Q10 =	6.69	4.33
30Q5 =	3.54	2.29	High Flow 30Q10	9.54	1.57
30Q10=	2.43	1.57	HM =	12.76	8.24

Flow frequencies (outfall 001)
North Fork Gills Creek, UT above Windy Gap Elementary School WWTP(#02056800)

	Drainage Area [mi^2] =		**2.1**	**mi^2**	
	ft^3/s	**MGD**		**ft^3/s**	**MGD**
1Q10 =	**0.13**	**0.08**	**High Flow 1Q10 =**	**0.57**	**0.37**
7Q10 =	**0.15**	**0.10**	**High Flow 7Q10 =**	**0.64**	**0.42**
30Q5 =	**0.34**	**0.22**	**High Flow 30Q10**	**0.92**	**0.59**
30Q10=	**0.23**	**0.15**	**HM =**	**1.23**	**0.79**

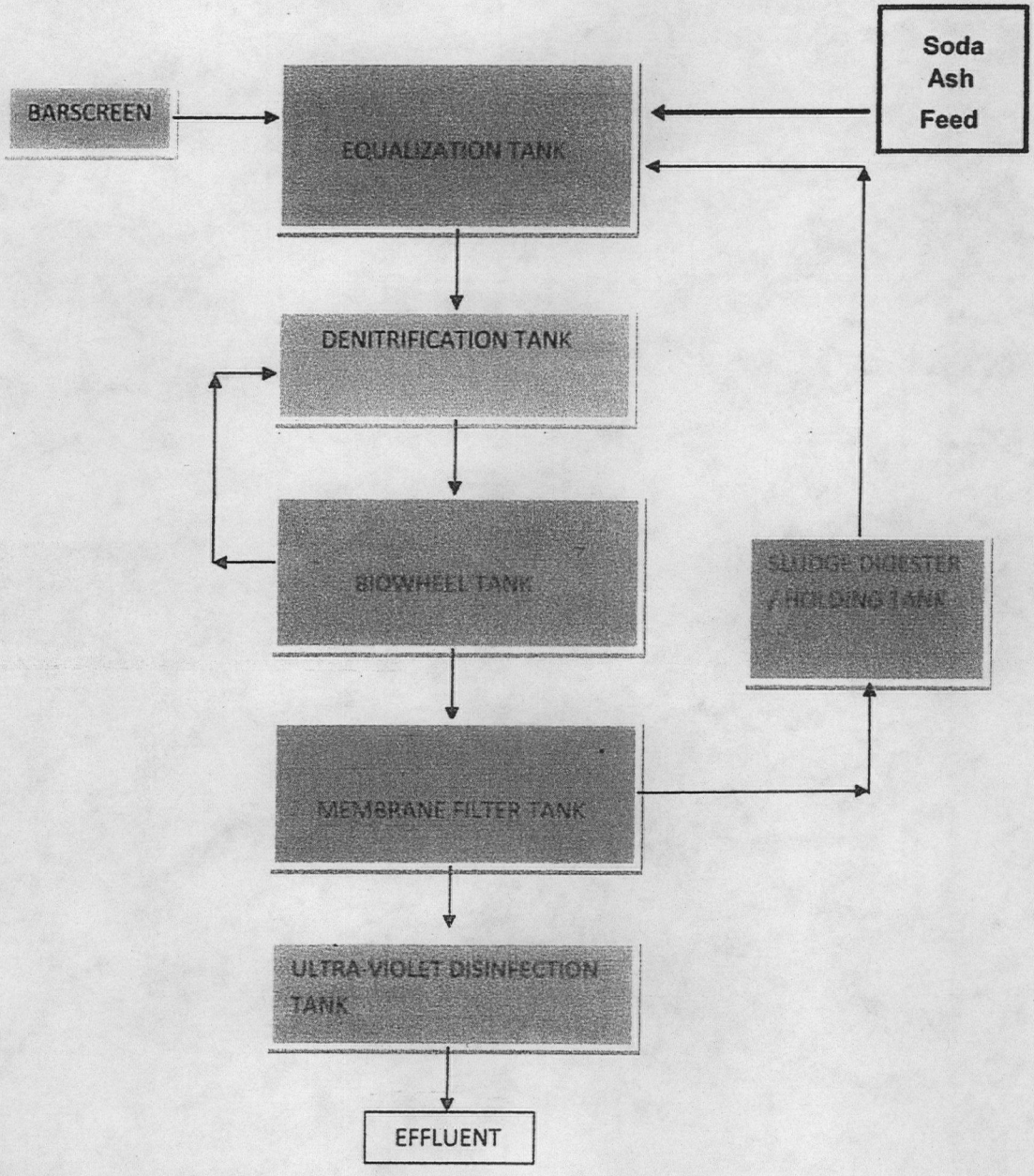
Flow frequencies (where tributary enters- use for 2nd segment of Regional DO Model)
North Fork Gills Creek (#02056800)

	Drainage Area [mi^2] =		2.95	mi^2	
	ft^3/s	MGD		ft^3/s	MGD
1Q10 =	0.18	0.12	High Flow 1Q10 =	0.80	0.52
7Q10 =	0.22	0.14	High Flow 7Q10 =	0.90	0.58
30Q5 =	0.48	0.31	High Flow 30Q10	1.29	0.83
30Q10=	0.33	0.21	HM =	1.72	1.11

SITEID	NAME	RECORD	LATLONG	DAAREA	HARMEAN	HF30Q10	HF7Q10	HF1Q10	Z30Q5	Z30Q10	Z7Q10	Z1Q10	Z1Q30	HFMTHS	Statperiod	Yrstrn
02058400	Pigg River near Sandy Level, Va.	R, 1963-	Lat 36 56'46", Long 79 31'29", NAD 83	351	209	171	134	123	86.4	66.7	49.9	44.8	27	JAN-MAY	1963-2011	2011

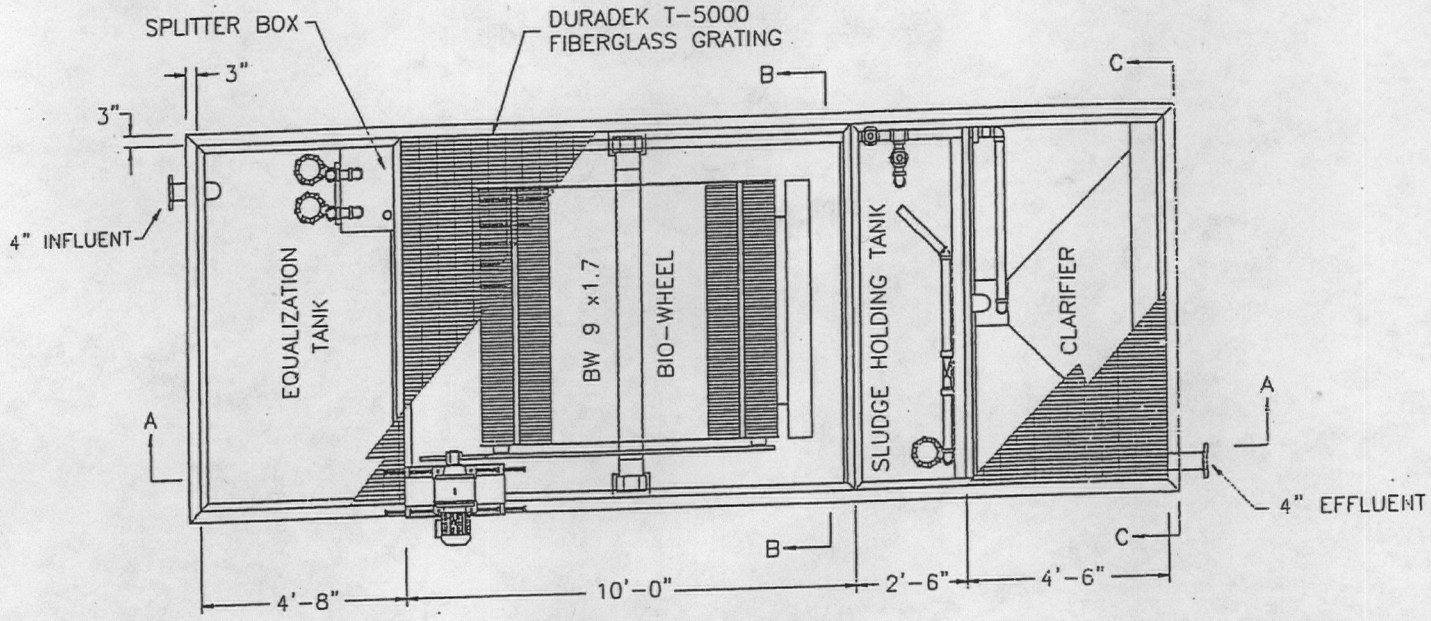
Attachment B

Wastewater Treatment Diagrams

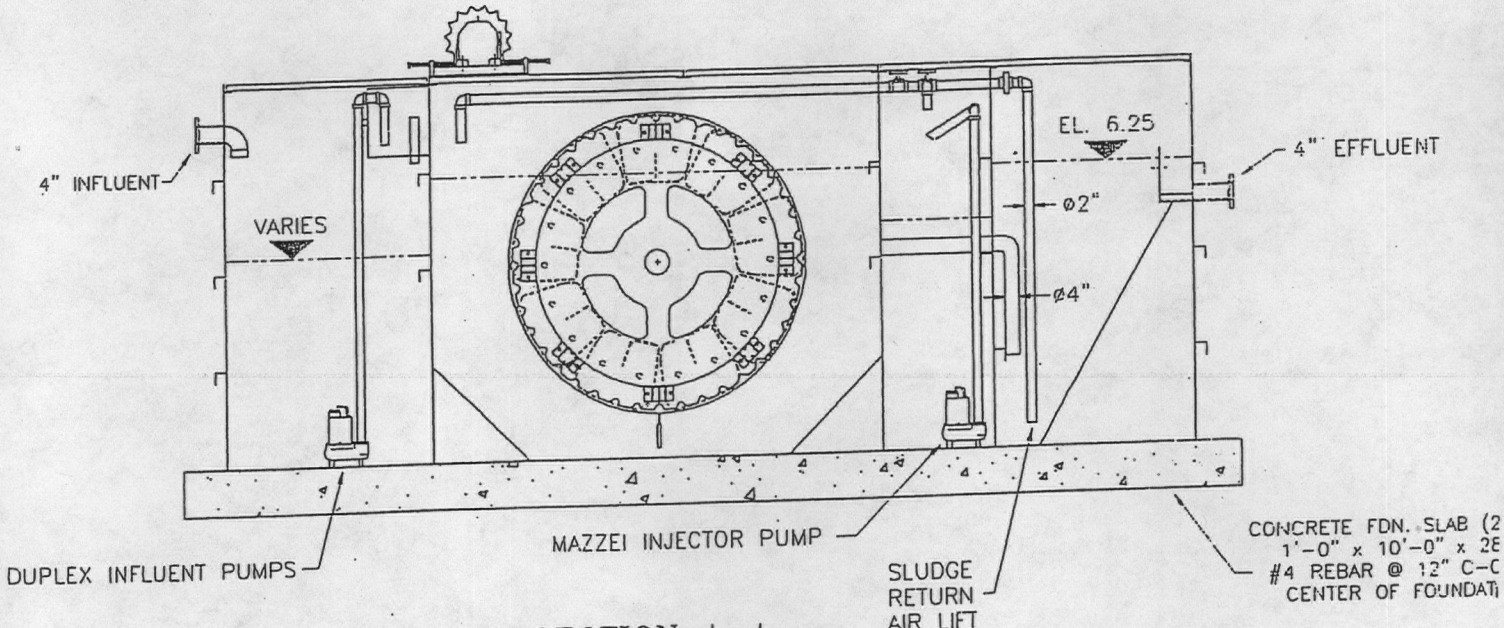


#6 Line Drawing

~~Proposed~~ Wastewater Treatment System
Windy Gap Elementary School
VA0090719



PLAN VIEW



SECTION A-A

Attachment C

Site Visit Report

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Blue Ridge Regional Office

3019 Peters Creek Road Roanoke, VA 24019

SUBJECT: Site Inspection Report for Windy Gap Elementary School WWTP, VA0090719

TO: Permit File

FROM: Becky L. France, Water Permit Writer

DATE: October 16, 2015

On October 15, 2015, a VPDES permit reissuance site visit was conducted at Windy Gap Elementary School WWTP. Ruthie Hurd-Dooley, operator; and Roger Houchins, Compliance Coordinator were present at the site visit. The school is located on Truman Hill Road (State Road 678) in a rural area of Franklin County just below a group of houses. Water is supplied to the site via a well. There is a grease trap for the wastewater from the cafeteria which is reported to be pumped and hauled to a wastewater treatment facility once per year.

Flow is measured from the school's potable water meter. The facility is operating well below the design capacity. The school may operate during a portion of the summer when summer school is held. During holidays and vacations between terms, the operator may add low fat dog food and bacterial cultures to keep the system operating. In 2014, a 6,000 gallon emergency overflow tank was added to receive any overflow from the equalization tank. In the event that the equalization tank begins to overflow into the emergency tank, an autodialer will notify the operator. Wastewater from the emergency tank can be manually pumped back into the existing treatment system for treatment.

The facility has an onsite generator which is reportedly cycled once a week. In the event of a power failure the treatment system motors need to be manually restarted. In the event of a power outage, an autodialer notifies the operator.

Wastewater from the school gravity flows to a 6,000 gallon package treatment plant. This system consists of equalization tank, denitrification tank, membrane filter tank, sludge tank, and ultraviolent disinfection light bank. The wastewater flows through a mechanical bar screen to an equalization tank. The 4,300 gallon equalization tank has two submersible pumps with float controls set at a predetermined level. Influent and mixed liquor suspended solids (MLSS) return flows are pumped to the bottom of the dentrification tank. The wastewater then flows to the Bio-Wheel. A variable speed gearmotor rotates the Bio-Wheel and aerates the basin. When the pH falls outside the designed range, the operator manually adds soda ash to the Bio-Wheel to achieve a minimum alkalinity. At the time of the site visit, the activated sludge appeared a dark chocolate brown, and the Bio-Wheel had a good grey film layer.

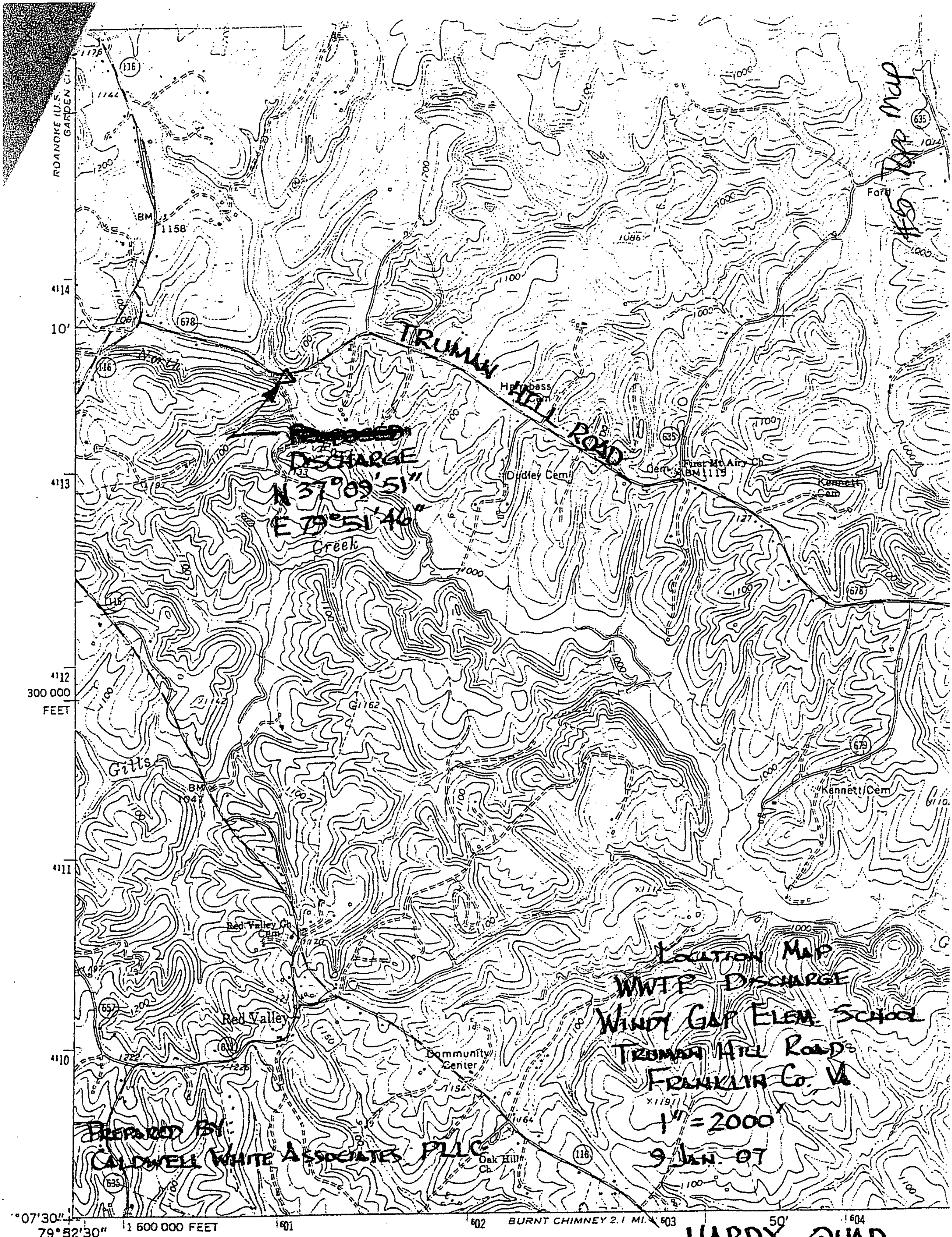
Wastewater from the Bio-Wheel enters a membrane filter tank. The membrane filter is set in the middle of the secondary sedimentation tank and consists of a single filter vault with parallel filters and diffusers. The membrane unit consists of a series of 50 plates covered on the sides with porous sheets of polyvinylidene fluoride (PVDF) which allow the passage of water but retains the solids. The tank also has sludge pumps to allow return of waste sludge to the sludge holding tank. A membrane aeration blower provides continuous cleaning of the membrane panels with water bubbles. The basin has a high water level alarm. According to the operator, the membrane filter is backwashed daily and cleaned once a year.

Permeated water from the membrane filter flows though a UV light bank with two UV lamps. At the time of the site visit, the lamp sensor detector was not operational due to an electrical storm. According to Ms. Dooley the UV bulb was replaced after the storm, and the replacement part had been ordered. The UV bulbs appeared to be operating correctly and the wastewater in the UV tank appeared clear.

Sludge is wasted from the membrane filter tank to the sludge holding tank. Sludge is periodically transported to a Henry County POTW. The last sludge hauling date was reported to be in August 2015. The effluent gravity flows through a pipe across the road to a perennial section of the North Fork of Gills Creek.

Attachment D

USGS Topographic Map



Mapped, edited, and published by the Geological Survey

Attachment E

Ambient Water Quality Information

- STORET Data (Station 4AGIL023.22)
- Fecal Coliform TMDL for Gills Creek (Excerpt)
- Gills Creek TMDL Revision

VAW-L11R
4AGIL023.22 (Rt 657 Bridge Near Headwaters - Franklin County)

Collection Date Time	Temp Celsius	DO Probe (mg/L)	Field pH (S.U.)
2/9/1999 15:30	8.3	11.6	7.2
5/4/1999 16:00	21	9.2	7.7
8/11/1999 11:00	24.3	8.6	8.1
8/11/1999 14:50	23.8	8	7.9
10/20/1999 10:00	13.2	8.8	7.5
12/21/1999 10:00	7.6	9.4	7.9
2/7/2000 11:00	2	12	8
4/18/2000 11:00	13.1	9.3	7
8/9/2000 15:00	26	7.2	8.9
10/11/2000 14:00	11.8	9.6	8.6
12/13/2000 10:00	0.4	13.1	7.7
2/15/2001 13:00	10.1	11	8.2
4/2/2001 11:30	8	11	8.4
6/4/2001 12:00	17	9.2	8.2
8/16/2001 14:30	21.3	8.75	6.71
10/17/2001 15:00	9.4	8.07	7.31
12/4/2001 14:50	7.2	11.04	8.38
2/14/2002 14:50	4.8	11.88	7.29
4/18/2002 15:30	25.5	8.93	7.77
6/3/2002 14:00	21.69	7.25	6.98
8/27/2002 10:30	20.8	7.5	8.24
10/23/2002 10:30	10.2	9.97	8.74
12/16/2002 10:20	7.1	11.65	8.06
2/11/2003 10:30	2	14.6	8.4
4/3/2003 11:00	12.4	10.3	7.5
6/19/2003 11:00	16.4	8.5	8
2/20/2007 11:00	4.2	14	7
4/9/2007 11:00	6.8	12.2	7.3
6/12/2007 14:00	19.5	8.3	6.8
8/1/2007 15:00	23.4	7.5	6.3
10/1/2007 14:00	14.1	9	6.5
12/11/2007 14:30	10.8	10.2	6.1
2/21/2008 15:30	5.5	10	7.3
4/2/2008 15:00	13.8	10.4	8
6/11/2008 14:00	22.6	7.2	7.3
10/20/2008 14:30	11.3	9.8	7.4
12/3/2008 15:00	4.3	12.6	6.8
2/19/2009 15:30	6.9	11.3	6.9
4/2/2009 16:00	10.7	10.1	7.1
6/17/2009 15:30	16.7	8.8	6.5
8/5/2009 15:30	21.5	8.1	7.8
10/7/2009 15:30	16.3	9	7.8
12/17/2009 15:30	8		7.2
2/17/2010 15:00	6.1		7.4
4/1/2010 14:00	16.8		7.2
6/3/2010 15:30	22		7.3
8/4/2010 16:00	23.9		7.6

90th Percentile pH	8.4	S.U.	
10th Percentile pH	6.8	S.U.	
90th Percentile Temperature	23.6	°C	
90th Percentile Temperature	18.1	°C	January - May

VAW-L11R

4AGIL023.22 (Rt 657 Bridge Near Headwaters - Franklin County)

Collection Date Time	Hardness, Total (mg/L as $CaCO_3$)
2/13/1995 14:30	23
6/26/1995 14:30	28
8/30/1995 15:30	24
11/6/1995 15:00	29
2/12/1996 14:30	12
5/6/1996 15:00	63
8/28/1996 15:00	24
11/14/1996 15:00	22
2/5/1997 15:00	22
5/6/1997 16:00	20.5
8/25/1997 15:00	22.2
11/18/1997 14:30	22.5
2/11/1998 14:00	24.2
5/26/1998 15:00	30.1
8/26/1998 15:00	24.9
11/16/1998 15:00	22
2/9/1999 15:30	44
5/4/1999 16:00	16
8/11/1999 11:00	26.9
10/20/1999 10:00	29.4
12/21/1999 10:00	24.4
2/7/2000 11:00	21.4
4/18/2000 11:00	24
8/9/2000 15:00	29.5
10/11/2000 14:00	20.1
12/13/2000 10:00	22.7
2/15/2001 13:00	16.4
4/2/2001 11:30	28.8
6/4/2001 12:00	18.8
8/16/2001 14:30	17.4
10/17/2001 15:00	5.6
12/4/2001 14:50	9.7
2/14/2002 14:50	15
4/18/2002 15:30	21.3
6/3/2002 14:00	23.4
8/27/2002 10:30	18.5
10/23/2002 10:30	22.1
12/16/2002 10:20	17
2/11/2003 10:30	27.1
4/3/2003 11:00	13.3
6/19/2003 11:00	19.4

Mean Hardness 23 mg/L (use default 25mg/L for wasteload allocation calculations)

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 1105, Richmond, Virginia 23218
Fax (804) 698-4500 TDD (804) 698-4021
www.deq.virginia.gov

Douglas W. Domenech
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

April 25, 2011

RE: Total Maximum Daily Load modifications for waste load allocations in the bacteria TMDL for Gills Creek.

The purpose of this memo is to describe to the public three modifications to waste load allocations (WLA) and text in the bacteria TMDL developed for the Gills Creek impairment. Gills Creek is part of the Blackwater River watershed, located in Franklin County, Virginia. EPA Region III approved the bacteria TMDL addressing primary contact recreational use impairment for Gills Creek on 5/31/2002. The combined modification submittal provides continuity between affected TMDL equations in the original TMDL report.

The VPDES permit for the Windy Gap Elementary School (E.S.) wastewater treatment plant, WWTP, is in the process of being reissued. The facility increased its design capacity from 0.004 MGD to 0.006 MGD. This memo discusses how the Waste Load Allocation (WLA) was calculated for the Windy Gap E.S. WWTP in the *Fecal Coliform TMDL Development for Gills Creek, Virginia* report, and how the design capacity increase affects the TMDL. Windy Gap E.S. WWTP was the only point source allocated in the Gills Creek TMDL.

Modification 1: The first change in the Gills Creek TMDL is to correct the original TMDL equation to account for the Margin of Safety in the basic TMDL Equation.

Modification 2: The second accommodates the Windy Gap WWTP design flow increase from 0.004 to 0.006 MGD and the resulting WLA and LA changes using the existing fecal coliform TMDL basis.

Modification 3: The third revision demonstrates the same relationship, and simply applies the current E.Coli Water Quality Standard. In both cases, the proposed design flow increase at the Windy Gap E.S. WWTP results in a WLA that is less than 1% of the final TMDL for Gills Creek.

Modification 3: The third change demonstrates the addition of some future growth to the WLA for each of the nine subwatersheds and the resulting affects on the Load Allocation. Accommodating the LA change will require an increase from 90% to 92% of the livestock bacteria loading reductions.

original reduction scenario outlined in the TMDL required a 90% load reduction from livestock. In order to reach the overall loading reductions required by the requested revisions, livestock loads will need to be reduced by 92%. DEQ indicates that the practices currently being used to achieve 90% reductions may be reasonably expected to achieve the 92% reductions that will be required.

Finally, EPA understands that DEQ provided public notice and a 15-day comment period for the requested revisions. No comments were received during this period. Based upon this information, EPA approves the requested modifications to the ~~Staunton River~~ Gills Creek TMDL. If you have any questions or comments concerning this letter, please do not hesitate to call me at (215) 814-5796.

Sincerely,

Helene Drago

Helene Drago, Manager
TMDL Program

Table 6.2 Load reductions to direct nonpoint sources in the Gills Creek impairment for Stage I implementation.

Subwatershed	Wildlife (cfu/year)			Straight Pipes (cfu/year)		
	Existing Load	Allocated Load	% Red.	Existing Load	Allocated Load	% Red.
1	2.15E+11	2.15E+11	0	7.58E+10	0.00E+00	100
2	8.82E+11	8.82E+11	0	2.91E+10	0.00E+00	100
3	6.37E+11	6.37E+11	0	6.25E+10	0.00E+00	100
4	2.48E+12	2.48E+12	0	5.15E+10	0.00E+00	100
5	2.20E+12	2.20E+12	0	8.66E+10	0.00E+00	100
6	5.29E+12	5.29E+12	0	5.50E+10	0.00E+00	100
7	3.04E+12	3.04E+12	0	2.84E+10	0.00E+00	100
8	3.10E+12	3.10E+12	0	4.08E+10	0.00E+00	100
9	3.34E+12	3.34E+12	0	4.26E+10	0.00E+00	100
TOTAL	2.12E+13	2.12E+13	0	4.72E+11	0.00E+00	100

Subwatershed	Lateral Flow (cfu/year)			Livestock (cfu/year)		
	Existing Load	Allocated Load	% Red	Existing Load	Allocated Load	% Red.
1	1.70E+08	1.70E+08	0	4.66E+12	3.83E+11	92
2	5.44E+07	5.44E+07	0	2.04E+12	1.68E+11	92
3	5.78E+07	5.78E+07	0	9.16E+12	7.53E+11	92
4	2.70E+07	2.70E+07	0	4.40E+13	3.62E+12	92
5	0.00E+00	0.00E+00	--	6.66E+12	5.47E+11	92
6	2.67E+07	2.67E+07	0	4.17E+13	3.43E+12	92
7	0.00E+00	0.00E+00	--	2.42E+12	1.99E+11	92
8	4.94E+08	4.94E+08	0	1.86E+12	1.53E+11	92
9	4.73E+08	4.73E+08	0	2.02E+12	1.66E+11	92
TOTAL	1.30E+09	1.30E+09	0	1.14E+14	9.41E+12	92

DEQ provided public notice and is providing a 15-day comment period on the TMDL modifications which expires on May 10, 2011. Following comment period and response to comments, DEQ will submit this request for modification of the Gills Creek TMDL for EPA approval.

The table below indicates the equation for the original TMDL for Gills Creek report:

Table 5.8 Average annual loads (cfu/year) modeled after TMDL allocation in the Gills Creek watershed.

Impairment	WLA[1]	LA	MOS	TMDL
Total	1.10E+10	1.99E+14	6.48E+12	1.99E+14

[1] The only point source permitted for fecal control in the Gills Creek drainage is Windy Gap Elementary School WWTP (VPDES # VA0090719). A design flow of 0.004 MGD at a fecal coliform concentration of 200 cfu/100 ml results in a WLA of 1.10E+10 cfu/year.

Revising the TMDL WLA and LA to accommodate the correction, design flow increase, and to account for some future growth up to a total change of 1% of the TMDL (Modifications 1, 2, and 3) would result in a new equation and does not change the TMDL value, nor the MOS.

Table 5.8 Average annual fecal loads (cfu/year) modeled after TMDL allocation in the Gills Creek watershed.

Impairment	WLA[1]	LA	MOS	TMDL
Total (Fecal)	1.99E+12	1.91E+14	6.48E+12	1.99E+14
Total (E. coli)	1.37E+11	1.30E+13	5.88E+11	1.37E+13

[1] The only point source permitted for fecal control in the Gills Creek drainage is Windy Gap Elementary School WWTP (VPDES # VA0090719). A design flow of 0.006 MGD and the original fecal coliform concentration of 200 cfu/100 ml results in a WLA of 1.65E+10 cfu/year. WLA for both WQS's includes a future growth component, not originally incorporated and is accommodated for this modified TMDL equation.

As a result of these changes to the WLA and the LA of the TMDL, a small change in the reductions is necessary to provide reasonable assurance that the TMDL will still be met. The existing reduction scenario outlined in the TMDL is found in Table 6.2 and required 90% reductions. In order to reach the overall loading required by the TMDL, the livestock LA loads will need to be reduced by 92 % in each of the subwatersheds instead of 90%. The practices to achieve the initial 90% reductions may reasonably be expected to attain the 92% reductions now called for.

MEMORANDUM
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
Blue Ridge Regional Office

3019 Peters Creek Rd. Roanoke, VA 24019

SUBJECT: Fecal Coliform TMDL Development for Gills Creek, Virginia (2002) and Windy Gap Elementary School WWTP (VA0090719) permit reissuance

TO: Dave Lazarus

FROM: Mary Dail

DATE: February 1, 2011

COPIES: Greg Anderson, Craig Lott, Becky France, Kip Foster, Mike McLeod

The VPDES permit for the Windy Gap Elementary School (E.S.) WWTP is in the process of being reissued. The facility increased its design capacity from 0.004 MGD to 0.006 MGD. This memo discusses how the Waste Load Allocation (WLA) was calculated for the Windy Gap E.S. WWTP in the *Fecal Coliform TMDL Development for Gills Creek, Virginia* and how the design capacity increase affects the TMDL. Windy Gap E.S. WWTP was the only point source allocated in the Gills Creek TMDL.

The first set of calculations below represent the existing fecal coliform TMDL and the resulting WLA after the design flow increase to 0.006 MGD. The second set of calculations demonstrate the same relationship when the current E.Coli Water Quality Standard is applied. In both cases, the design flow increase at the Windy Gap E.S. WWTP results in a WLA that is less than 1% of the final TMDL for Gills Creek.

Existing TMDL (based on Water Quality Standard Geomean for Fecal Coliform of 200 cfu/100 ml)

Annual Waste Load Allocation (WLA) = 1.10 E+10 (*Fecal Coliform TMDL Development for Gills Creek, Virginia*, Page 5-19)

This WLA was calculated using the existing design flow of 4,000 gallons per day and applying the equation below:

WLA = Design Flow (GPD) * conversion: gallons to 100 mL * Permitted Limit * 365

WLA = 4,000 GPD * 37.8542 100 mL * 200 cfu/100 mL * 365

WLA = 1.10 E+11 cfu/year fecal coliform

Conversion:

37.85412 (Geldreich, 1978; conversion factor used to convert gallons to 100 mL)

Windy Gap E. S. WWTP design capacity increase

This WLA was calculated using the increased design flow of 6,000 gallons per day and applying the equation below:

WLA = Design Flow (GPD) * conversion: gallons to 100 mL * Permitted Limit * 365

WLA = 6,000 GPD * 37.8542 100 mL * 200 cfu/100 mL * 365

WLA = 1.65 E+10 cfu/year fecal coliform

The final TMDL for Gills Creek is 1.99 E+14 cfu/year (*Fecal Coliform TMDL Development for Gills Creek, Virginia*, Page 5-19) and the Windy Gap E.S. WWTP WLA based on the design flow increase is less than 1% of the final TMDL.

Existing TMDL (based on current Water Quality Standard Geomean for E. Coli of 126 cfu/100 ml)

This WLA was calculated using the existing design flow of 4,000 gallons per day and applying the equation below:

WLA = Design Flow (GPD) * conversion: gallons to 100 mL * Permitted Limit * 365

WLA = 4,000 GPD * 37.8542 100 mL * 126 cfu/100 mL * 365

WLA = 6.96 E+09 cfu/year E. Coli

Conversion:

1 gallon = 37.85412 (Geldreich, 1978; conversion factor used to convert gallons to 100 mL)

Windy Gap E. S. WWTP design capacity increase (based on current Water Quality Standard Geomean for E. Coli of 126 cfu/100 ml)

This WLA was calculated using the increased design flow of 6,000 gallons per day and applying the equation below:

WLA = Design Flow (GPD) * conversion: gallons to 100 mL * Permitted Limit * 365

WLA = 6,000 GPD * 37.8542 100 mL * 126 cfu/100 mL * 365

WLA = 1.04 E+10 cfu/year E.Coli

The final TMDL for Gills Creek is 1.99 E+14 cfu/year (*Fecal Coliform TMDL Development for Gills Creek, Virginia*, Page 5-19). Using the fecal coliform to E.Coli translator (see below), the final TMDL for E.Coli is 1.36 E+13 cfu/year E.Coli. The Windy Gap E.S. WWTP E.Coli WLA based on the design flow increase is less than 1% of the final E.Coli TMDL.

Fecal Coliform → E. Coli Conversion:

The following formula is used to translate in-stream Fecal Coliform to E. Coli concentration:

Log 2 EC = -0.0172 + 0.91905 * Log 2 FC

In Excel the equation is solved by entering: =2^(-0.0172 + (0.91905 * LOG(FC,2)))
Note: replace FC with actual number.

Fecal Coliform TMDL

(Total Maximum Daily Load)

Development for

Gills Creek,

Virginia

Prepared By

MapTech Inc., Blacksburg, VA

for

Virginia Department of Environmental Quality, and
Virginia Department of Conservation and Recreation

April 25, 2002

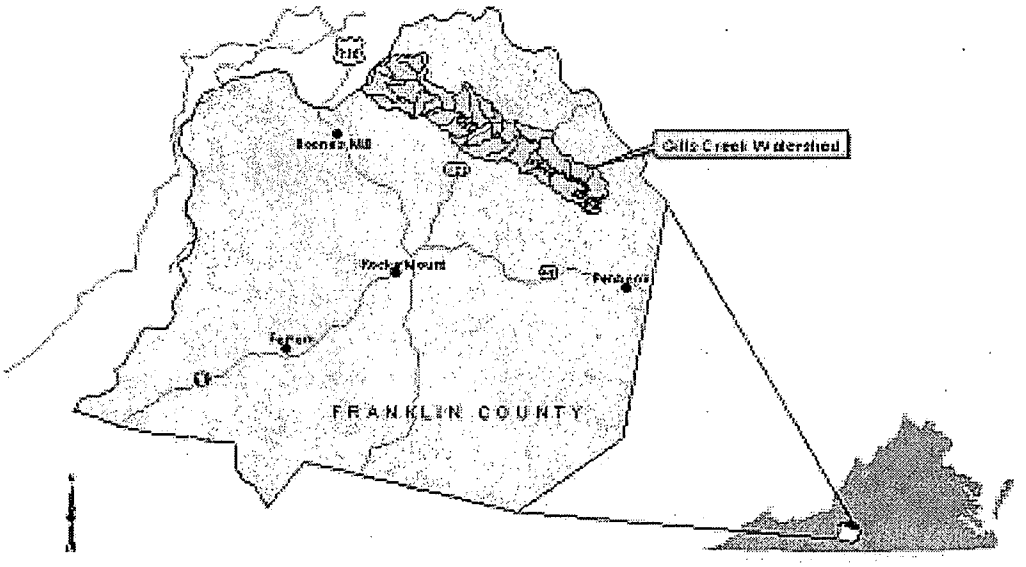


Figure 1.1 Location of the Gills Creek watershed.

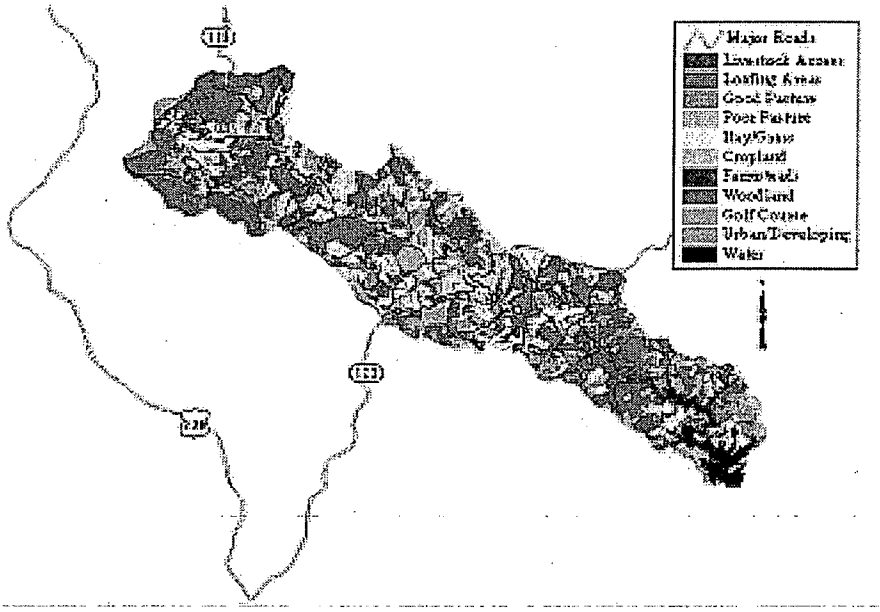


Figure 1.2 Land uses in the Gills Creek watershed.

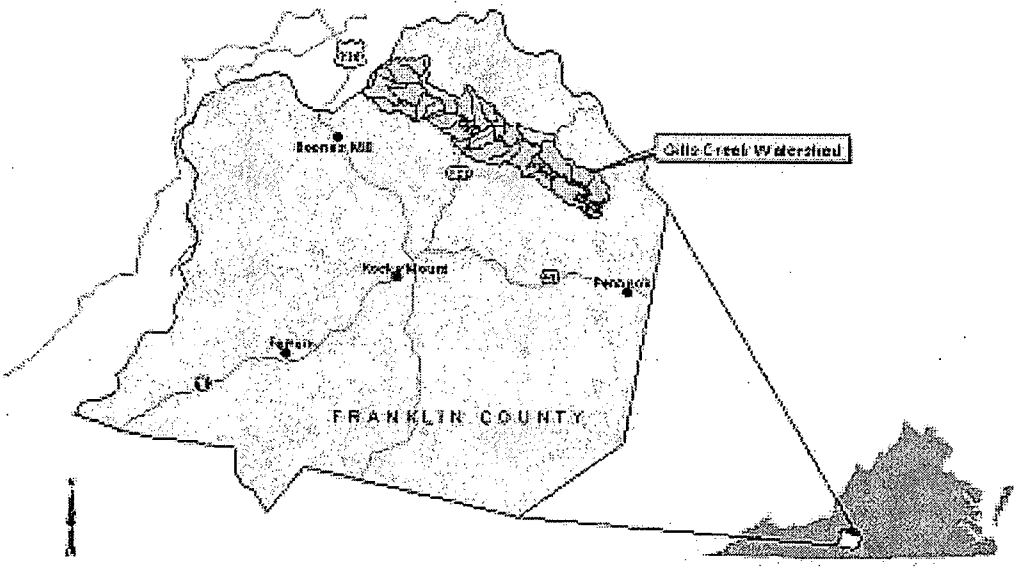


Figure 1.1 Location of the Gills Creek watershed.

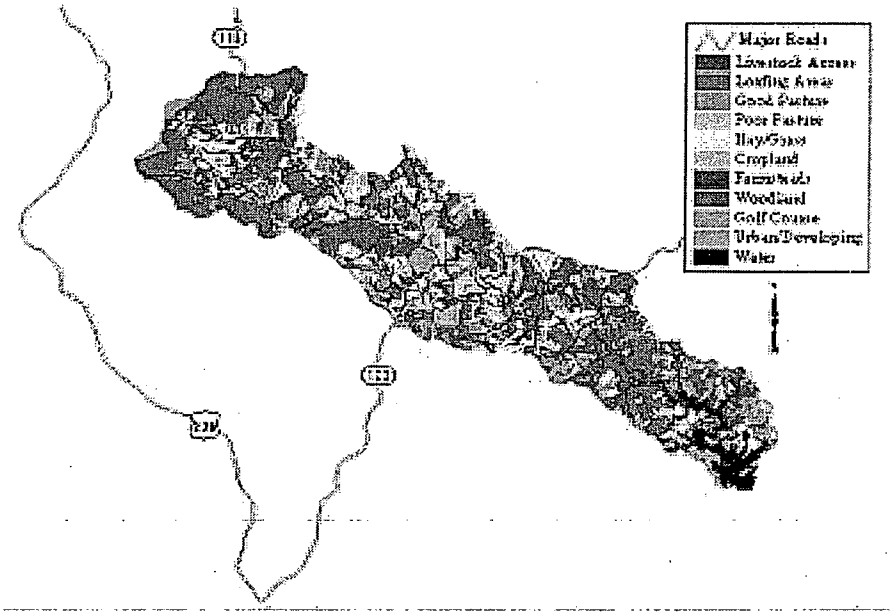


Figure 1.2 Land uses in the Gills Creek watershed.

modeled over the entire duration of a representative modeling period, and pollutant loads were adjusted until the standard, reduced by a margin of safety equal to 5%, was met (Figure 5.8). The development of the allocation scenario was an iterative process that required numerous runs with each followed by an assessment of source reduction against the water quality target.

5.3.1 Wasteload Allocations

The Windy Gap Elementary School Wastewater Treatment Plant is the only permitted point source located within the Gills Creek impairment. School construction is slated for 2003-2004 concluding around August 2004. After which, discharge from facility will commence. This source has no limit on discharge but is designed to process 0.004 MGD. The impact on in-stream fecal coliform levels from this source was considered negligible. The allocation of the point source, Windy Gap Elementary School Wastewater Treatment Plant, is equivalent to its current permit levels (i.e. 0.004 MGD and 200 cfu/100ml).

5.3.2 Load Allocations

Load allocations to nonpoint sources are divided into land-based loadings from land uses and direct applied loads in the stream (e.g. livestock, septic systems within 50 feet of a stream, and wildlife). Source reductions include those that are affected by both high and low flow conditions. Within this framework, however, initial criteria that influenced developing load allocations included how sources were linked for representing existing conditions, and results from bacterial source tracking in the area. Direct deposition nonpoint sources were modeled with consistent loadings to the stream regardless of flow regime and had a significant impact on low flow concentrations. Bacterial source tracking during five 2001 sampling periods confirmed the presence of human, livestock and wildlife contamination.

With the impact of in-stream deposition very large, and the presence of human, livestock, and wildlife fecal material, an initial scenario was 100% reduction of uncontrolled residential discharges and 90% reduction in livestock stream access. All land-based allocations remained at existing conditions, that is, zero reduction.

Table 5.8 represents the average annual loads during the modeled period after allocation of pollutant loads. Loads from permitted point sources (WLA) and nonpoint sources (LA) are represented, as are the load associated with the margin of safety (MOS) and the sum of these three loads (TMDL). It is worth noting that the MOS is much less than 5% of the TMDL. This outcome illustrates the inherent difference between concentration, which is the amount of a pollutant (e.g. numbers of fecal coliforms) in a given volume of water, and annual loads, which is the total amount of the pollutant regardless of the volume of water. Additionally, this situation reflects the fact that it would be inappropriate to use annual loads, such as those in Table 5.7, as a target goal for meeting a water quality standard that is based on concentrations.

Table 5.8 Average annual loads (cfu/year) modeled after TMDL allocation in the Gills Creek watershed.

Impairment	WLA[1]	LA	MOS	TMDL
Total	1.10E+10	1.99E+14	6.48+12	1.99E+14

1 The only point source permitted for fecal control in the Gills Creek drainage is Windy Gap Elementary School WWTP (VPDES # VA0090719). A design flow of 0.004 MGD at a fecal coliform concentration of 200 cfu/100 ml results in a WLA of 1.10E+10 cfu/year.

The practical implications of a required reduction in wildlife direct deposition would suggest that some alternative water quality target may be in order, as implied by the state's legislative language regarding naturally occurring and low-flow conditions (Section 1.2). However, the purpose of the TMDL development process is to assess all sources contributing to the impairment. It is this assessment that identifies these naturally occurring and/or low flow conditions and thereby can serve as a means of triggering the legislative response (i.e. removal of a designated use, Virginia State Law Section 9VAC25-260-10, Subsection G).

Future growth was estimated and projected to the year 2006. Population growth was based on 19.6% increase for the period from 1990 through 2000 (USCB, 2000). Dairy numbers were found to be decreasing at the rate of 5.91% per year with beef numbers decreasing at the rate of 6.20% per year (VASS,1998; VASS, 1999; MapTech, 1999). For the year 2006 projection, the percent difference in land-based and directly deposited

waste was calculated. Because the TMDL specifies 100% exclusion of livestock from streams and 100% elimination of straight pipes, direct load allocations for this projection are based solely on an increase in lateral flow from septic systems within 50 ft of a stream. This increase in direct loads is negligible (i.e. <0.0001% increase). With decreasing trends in livestock, projected land-based waste load on agricultural land uses was assumed to at least equal current loads. Increases in land-based waste on the urban land use were projected to increase by a maximum of 10.9%. Based on the sensitivity analysis, a 10% land-based load increase on all land uses would produce a maximum geometric mean increase of 3.6% (Figure 5.6). Figure 5.7 shows that, during wet periods, a 3.6% increase in the geometric mean could be tolerated without violating the standard.

Attachment F

Effluent Data

Windy Gap Elementary School WWTP
VPDES Permit No. VA0090719

Effluent Temperature Data for 90th Percentile Calculation

Days	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Aug-15	Sep-15
1	24		16				15	15		26
2	24		15		12	11				25
3	24	20	16		12	11				25
4			16		13	12		15	24	25
5		21	16		13	12		16		
6	23	20		12	12			17	24	
7	23	18		14				19		
8	23		15	11			15	20		26
9	23		14	12	13	12	15			25
10	22	19	14		14	14	15			25
11		19	14		14	14		22	26	25
12		21	14	11	12	14		23	25	
13		17	15	14		14	15	23	25	
14	22	16					15	22	25	24
15	22		15	13			15	22		25
16	23		15	13		14	15			24
17	23	15	15			15	16		25	25
18		14	15			15		22	25	23
19		14	15			14		23	25	
20	21	15		13		14	15	24	25	
21	22	15		14			16	23	25	25
22	21			14			13	21		23
23	19			13	9	14	15			23
24	20	16			8	14	15		25	23
25		16			9	14			25	23
26		15		14	9	14		20	25	
27	21			13		14	15	22	25	
28	21			13			15	23	25	23
29	21			14			15			23
30	21			13		15	15			24
31	20					15			25	

90th percentile	25	°C	
90th percentile	22	°C	January - May

Windy Gap Elementary School WWTP
VA0090719

Effluent pH (S.U.)

Date Due	min	max
10-Sep-11	6.9	8.4
10-Oct-11	7	7.8
10-Nov-11	7.2	8.1
10-Dec-11	7.2	7.8
10-Jan-12	7	7.6
10-Feb-12	6.9	7.7
10-Mar-12	6.9	7.4
10-Apr-12	7	7.8
10-May-12	7.4	8.3
10-Jun-12	6.9	8.3
10-Jul-12	7.5	7.7
10-Aug-12	7.5	7.6
10-Sep-12	7.1	7.6
10-Oct-12	6.4	7.6
10-Nov-12	6.1	7.5
10-Dec-12	7.1	7.5
10-Jan-13	7.3	7.5
10-Feb-13	7.2	7.7
10-Mar-13	7	7.6
10-Apr-13	7	7.5
10-May-13	7.3	8.3
10-Jun-13	7.2	7.6
10-Jul-13	7.4	7.8
10-Sep-13	6.7	8.7
10-Oct-13	7.2	7.7
10-Nov-13	7.3	7.7
10-Dec-13	6.5	7.8
10-Jan-14	7.2	8.1
10-Feb-14	6.9	8.6
10-Mar-14	7.1	8.5
10-Apr-14	7	7.5
10-May-14	7	7.7
10-Jun-14	6.6	7.5
10-Aug-14	7.5	7.5
10-Sep-14	6.7	7.9
10-Oct-14	7.2	7.8
10-Nov-14	7.1	7.7
10-Dec-14	7.2	7.5
10-Jan-15	7	7.6
10-Feb-15	7	7.9
10-Mar-15	7	7.6
10-Apr-15	7.1	7.8
10-May-15	7.1	7.6
10-Jun-15	7.2	7.6
10-Sep-15	7	7.9

90th Percentile pH	8.3	S.U.
10th Percentile pH	6.7	S.U.

Windy Gap Elementary School WWTP
VA0090719

Date Due	Flow	*E. coli*		DO	TSS			
	MGD	NCM./L		mg/L	g/d		mg/L	
	Average	Average	Maximum	Minimum	Average	Maximum	Average	Maximum
Limits	**0.006**	**126**	**235**	**5.0**	**680**	**1000**	**30**	**45**
10-Sep-11	0.001	<2.0	<2.0	5.6	<QL	<QL	<QL	<QL
10-Oct-11	0.0012	<2.0	<2.0	5.9	<QL	<QL	<QL	<QL
10-Nov-11	0.0011	<2.0	<2.0	5.4	<QL	<QL	<QL	<QL
10-Dec-11	0.0011	<2.0	<2.0	5.6	<QL	<QL	<QL	<QL
10-Jan-12	0.0012	<2.0	<2.0	5.3	<QL	<QL	<QL	<QL
10-Feb-12	0.002	<2.0	<2.0	5.3	<QL	<QL	<QL	<QL
10-Mar-12	0.0023	<2.0	<2.0	5.4	<QL	<QL	<QL	<QL
10-Apr-12	0.0023	<2.0	<2.0	6.1	<QL	<QL	<QL	<QL
10-May-12	0.0023	<2.0	<2.0	6.3	<QL	<QL	<QL	<QL
10-Jun-12	0.0023	<2.0	<2.0	5.7	<QL	<QL	<QL	<QL
10-Jul-12	0.0021	<2.0	<2.0	6.3	<QL	<QL	<QL	<QL
10-Aug-12	0.0014	<2.0	<2.0	5.9	<QL	<QL	<QL	<QL
10-Sep-12	0.0015	<2.0	<2.0	5.6	<QL	<QL	<QL	<QL
10-Oct-12	0.0017	<2.0	<2.0	5.2	21.9	21.9	2.9	2.9
10-Nov-12	0.0016	2	2	5.1	<QL	<QL	<QL	<QL
10-Dec-12	0.0016	2	2	5.1	53	53	9.3	9.3
10-Jan-13	0.0015	<QL	2	5	34	34	6.1	6.1
10-Feb-13	0.0016	2	2	5.1	67	67	11.8	11.8
10-Mar-13	0.0018	1	<QL	5.2	28	28	5	5
10-Apr-13	0.0018	1	1	5.3	19.3	19.3	3.4	3.4
10-May-13	0.0017	NR	<1.8	5.1	<QL	<QL	<QL	<QL
10-Jun-13	0.0018	2	2	5.5	<QL	<QL	<QL	<QL
10-Jul-13	0.0015	2	2	5.6	<QL	<QL	<QL	<QL
10-Sep-13	0.0017	1	NR	5.2	22	22	3.9	3.9
10-Oct-13	0.0018	1	1	5.3	<QL	<QL	<QL	<QL
10-Nov-13	0.0018	1	NR	5.1	<QL	<QL	<QL	<QL
10-Dec-13	0.0034	1	NR	5.3	6	6	1	1
10-Jan-14	0.0017	NR	2	5.8	<QL	<QL	<QL	<QL
10-Feb-14	0.0017	1	NULL	5.9	<QL	<QL	<QL	<QL
10-Mar-14	0.0018	NR	1	5.9	<QL	<QL	<QL	<QL
10-Apr-14	0.0019	1	NR	5.9	<QL	<QL	<QL	<QL
10-May-14	0.0018	1	NR	5.8	<QL	<QL	<QL	<QL
10-Jun-14	0.0018	1	NR	6.5	<QL	<QL	<QL	<QL
10-Aug-14	0.006	NR	1	7.6	<QL	<QL	<QL	<QL
10-Sep-14	0.0018	1	NR	6	<QL	<QL	<QL	<QL
10-Oct-14	0.0018	1	NR	6.1	<QL	<QL	<QL	<QL
10-Nov-14	0.0018	1	NR	6.1	<QL	<QL	<QL	<QL
10-Dec-14	0.0018	1	NR	6.3	<QL	<QL	<QL	<QL
10-Jan-15	0.0017	NR	1	6.1	<QL	<QL	<QL	<QL
10-Feb-15	0.0018	2	NR	6.3	<QL	<QL	<QL	<QL
10-Mar-15	0.0017	NR	1	6.3	<QL	<QL	<QL	<QL
10-Apr-15	0.0018	1	NR	6.3	34	34	6	6
10-May-15	0.0018	1	NR	6.3	40	40	7	7
10-Jun-15	0.0018	1	NR	6.2	17	17	3	3
10-Sep-15	0.0017	1	NR	6.3	<QL	<QL	<QL	<QL

Windy Gap Elementary School WWTP
VA0090719

Date Due	BOD_5			
	g/d		mg/L	
	Average	Maximum	Average	Maximum
Limits	**680**	**1000**	**30**	**45**
10-Sep-11	<QL	<QL	<QL	<QL
10-Oct-11	<QL	<QL	<QL	<QL
10-Nov-11	<QL	<QL	<QL	<QL
10-Dec-11	<QL	<QL	<QL	<QL
10-Jan-12	<QL	<QL	<QL	<QL
10-Feb-12	<QL	<QL	<QL	<QL
10-Mar-12	<QL	<QL	<QL	<QL
10-Apr-12	<QL	<QL	<QL	<QL
10-May-12	<QL	<QL	<QL	<QL
10-Jun-12	<QL	<QL	<QL	<QL
10-Jul-12	<QL	<QL	<QL	<QL
10-Aug-12	<QL	<QL	<QL	<QL
10-Sep-12	<QL	<QL	<QL	<QL
10-Oct-12	<QL	<QL	<QL	<QL
10-Nov-12	<QL	<QL	<QL	<QL
10-Dec-12	<QL	<QL	<QL	<QL
10-Jan-13	34	34	5.8	5.8
10-Feb-13	19	19	3.4	3.4
10-Mar-13	<QL	<QL	<QL	<QL
10-Apr-13	<QL	<QL	<QL	<QL
10-May-13	<QL	<QL	<QL	<QL
10-Jun-13	<QL	<QL	<QL	<QL
10-Jul-13	<QL	<QL	<QL	<QL
10-Sep-13	<QL	<QL	<QL	<QL
10-Oct-13	<QL	<QL	<QL	<QL
10-Nov-13	<QL	<QL	<QL	<QL
10-Dec-13	<QL	<QL	<QL	<QL
10-Jan-14	<QL	<QL	<QL	<QL
10-Feb-14	<QL	<QL	<QL	<QL
10-Mar-14	<QL	<QL	<QL	<QL
10-Apr-14	<QL	<QL	<QL	<QL
10-May-14	<QL	<QL	<QL	<QL
10-Jun-14	<QL	<QL	<QL	<QL
10-Aug-14	<QL	<QL	<QL	<QL
10-Sep-14	<QL	<QL	<QL	<QL
10-Oct-14	<QL	<QL	<QL	<QL
10-Nov-14	<QL	<QL	<QL	<QL
10-Dec-14	<QL	<QL	<QL	<QL
10-Jan-15	<QL	<QL	<QL	<QL
10-Feb-15	<QL	<QL	<QL	<QL
10-Mar-15	<QL	<QL	<QL	<QL
10-Apr-15	<QL	<QL	<QL	<QL
10-May-15	<QL	<QL	<QL	<QL
10-Jun-15	<QL	<QL	<QL	<QL
10-Sep-15	<QL	<QL	<QL	<QL

Windy Gap Elementary School WWTP
VA0090719

Date Due	Ammonia (mg/L)	
	Average	Maximum
Ammonia (Jan-May Limits)	**15**	**15**
Ammonia (June-Dec Limits)	**9.5**	**9.5**
10-Sep-09	<QL	<QL
10-Oct-09	<QL	<QL
10-Nov-09	<QL	<QL
10-Dec-09	<QL	<QL
10-Jan-10	<QL	<QL
10-Feb-10	<QL	<QL
10-Mar-10	<QL	<QL
10-Apr-10	1.8	1.8
10-May-10	0.43	0.43
10-Jun-10	<QL	<QL
10-Jul-10	<QL	<QL
10-Aug-10	2.5	2.5
10-Sep-10	<QL	<QL
10-Oct-10	<QL	<QL
10-Nov-10	<QL	<QL
10-Dec-10	<QL	<QL
10-Jan-11	<QL	<QL
10-Feb-11	<QL	<QL
10-Mar-11	0.46	0.46
10-Apr-11	<QL	<QL
10-May-11	<QL	<QL
10-Jun-11	1.6	1.6
10-Jul-11	0.24	0.24
10-Aug-11	<QL	<QL
10-Sep-11	<QL	<QL
10-Oct-11	<QL	<QL
10-Nov-11	<QL	<QL
10-Dec-11	<QL	<QL
10-Jan-12	<QL	<QL
10-Feb-12	2.4	2.4
10-Mar-12	<QL	<QL
10-Apr-12	<QL	<QL
10-May-12	<QL	<QL
10-Jun-12	<QL	<QL
10-Jul-12	<QL	<QL
10-Aug-12	<QL	<QL
10-Sep-12	<QL	<QL
10-Oct-12	0.19	0.19
10-Nov-12	0.24	0.24
10-Dec-12	1.1	1.1
10-Jan-13	1.9	1.9
10-Feb-13	**26**	**26**
10-Mar-13	<QL	<QL
10-Apr-13	0.11	0.11
10-May-13	2	2
10-Jun-13	3.4	3.4
10-Jul-13	<QL	<QL
10-Sep-13	<QL	<QL
10-Oct-13	<QL	<QL
10-Nov-13	<QL	<QL
10-Dec-13	<QL	<QL

Windy Gap Elementary School WWTP
VA0090719

Date Due	Ammonia (mg/L)	
	Average	Maximum
Ammonia (Jan-May Limits)	**15**	**15**
Ammonia (June-Dec Limits)	**9.5**	**9.5**
10-Jan-14	<QL	NR
10-Jan-14	<QL	<QL
10-Feb-14	3	3
10-Mar-14	5	5
10-Apr-14	<QL	<QL
10-May-14	<QL	<QL
10-Jun-14	<QL	<QL
10-Aug-14	<QL	<QL
10-Sep-14	<QL	<QL
10-Oct-14	<QL	<QL
10-Nov-14	<QL	<QL
10-Dec-14	0.11	0.11
10-Jan-15	0.69	0.69
10-Feb-15	<QL	<QL
10-Mar-15	1	1
10-Apr-15	1	1
10-May-15	<QL	<QL
10-Jun-15	<QL	<QL
10-Sep-15	1.2	1.2
10-Oct-15	<QL	<QL
10-Nov-15	0.21	0.21

Windy Gap Elementary School WWTP
VA0090719

Date Due	Ammonia (Jan - May) (mg/L)	
	Average	Maximum
Limits	**15**	**15**
10-Feb-12	2.4	2.4
10-Mar-12	<QL	<QL
10-Apr-12	<QL	<QL
10-May-12	<QL	<QL
10-Jun-12	<QL	<QL
10-Feb-13	**26**	**26**
10-Mar-13	<QL	<QL
10-Apr-13	0.11	0.11
10-May-13	2	2
10-Jun-13	3.4	3.4
10-Jan-14	<QL	NR
10-Feb-14	3	3
10-Mar-14	5	5
10-Apr-14	<QL	<QL
10-May-14	<QL	<QL
10-Jun-14	<QL	<QL
10-Feb-15	<QL	<QL
10-Mar-15	1	1
10-Apr-15	1	1
10-May-15	<QL	<QL
10-Jun-15	<QL	<QL

Windy Gap Elementary School WWTP
VA0090719

Date Due	Ammonia (June - Dec.) (mg/L)	
	Average	Maximum
Limits	**9.5**	**9.5**
10-Sep-11	<QL	<QL
10-Oct-11	<QL	<QL
10-Nov-11	<QL	<QL
10-Dec-11	<QL	<QL
10-Jan-12	<QL	<QL
10-Jul-12	<QL	<QL
10-Aug-12	<QL	<QL
10-Sep-12	<QL	<QL
10-Oct-12	0.19	0.19
10-Nov-12	0.24	0.24
10-Dec-12	1.1	1.1
10-Jan-13	1.9	1.9
10-Jul-13	<QL	<QL
10-Sep-13	<QL	<QL
10-Oct-13	<QL	<QL
10-Nov-13	<QL	<QL
10-Dec-13	<QL	<QL
10-Jan-14	<QL	<QL
10-Aug-14	<QL	<QL
10-Sep-14	<QL	<QL
10-Oct-14	<QL	<QL
10-Nov-14	<QL	<QL
10-Dec-14	0.11	0.11
10-Jan-15	0.69	0.69
10-Sep-15	1.2	1.2

Windy Gap Elementary School WWTP
VA0090719

Effluent Nutrient Monitoring Data (grab samples)

Date	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)
10-Sep-09	0.5	0.07
10-Oct-09	2.31	3.99
10-Nov-09	8.9	6.37
10-Dec-09	35.54	13.39
10-Jan-10	26.24	13.39
10-Feb-10	47.8	9.7
10-Mar-10	17.17	3.7
10-Apr-10	45	9.5
10-May-10	42.1	16.3
10-Jun-10	44.3	6.6
10-Jul-10	20.7	11.9
10-Aug-10	20.6	5.6
10-Sep-10	33.1	7

Attachment G

Wasteload and Limit Calculations

- Mixing Zone Calculations (MIXER 2.1)
- Antidegradation Wasteload Allocation Spreadsheet
- STATS Program Results (ammonia, TRC)

Mixing Zone Predictions for Windy Gap Elementary School WWTP

Effluent Flow = 0.006 MGD
Stream 7Q10 = 0.13 MGD
Stream 30Q10 = 0.20 MGD
Stream 1Q10 = 0.11 MGD
Stream slope = 0.020 ft/ft
Stream width = 2.04 ft
Bottom scale = 2
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = .151 ft
Length = 24.11 ft
Velocity = .682 ft/sec
Residence Time = .0004 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = .1971 ft
Length = 18.8 ft
Velocity = .7929 ft/sec
Residence Time = .0003 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = .1368 ft
Length = 26.37 ft
Velocity = .6432 ft/sec
Residence Time = .0114 hours

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 1Q10 may be used.

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Windy Gap Elementary School WWTP Permit No.: VA0090719

Receiving Stream: North Fork Gills Creek, UT Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		Stream Flows		Mixing Information		Effluent Information	
Mean Hardness (as CaCO3) =	25 mg/L	1Q10 (Annual) =	0.08 MGD	Annual - 1Q10 Mix =	100 %	Mean Hardness (as CaCO3) =	25 mg/L
90% Temperature (Annual) =	23.6 deg C	7Q10 (Annual) =	0.1 MGD	- 7Q10 Mix =	100 %	90% Temp (Annual) =	25 deg C
90% Temperature (Wet season) =	18.1 deg C	30Q10 (Annual) =	0.15 MGD	- 30Q10 Mix =	100 %	90% Temp (Wet season) =	22 deg C
90% Maximum pH =	8.4 SU	1Q10 (Wet season) =	0.37 MGD	Wet Season - 1Q10 Mix =	100 %	90% Maximum pH =	8.3 SU
10% Maximum pH =	6.8 SU	30Q10 (Wet season)	0.59 MGD	- 30Q10 Mix =	100 %	10% Maximum pH =	6.7 SU
Tier Designation (1 or 2) =	2	30Q5 =	0.22 MGD			Discharge Flow =	0.006 MGD
Public Water Supply (PWS) Y/N? =	n	Harmonic Mean =	0.79 MGD				
Trout Present Y/N? =	n						
Early Life Stages Present Y/N? =	y						

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Acenapthene	0	--	--	na	9.9E+02	--	--	na	3.7E+04	--	--	na	9.9E+01	--	--	na	3.7E+03	--	--	na	**3.7E+03**
Acrolein	0	--	--	na	9.3E+00	--	--	na	3.5E+02	--	--	na	9.3E-01	--	--	na	3.5E+01	--	--	na	**3.5E+01**
Acrylonitrile[C]	0	--	--	na	2.5E+00	--	--	na	3.3E+02	--	--	na	2.5E-01	--	--	na	3.3E+01	--	--	na	**3.3E+01**
Aldrin [C]	0	3.0E+00	--	na	5.0E-04	4.3E+01	--	na	6.6E-02	7.5E-01	--	na	5.0E-05	1.1E+01	--	na	6.6E-03	**1.1E+01**	--	na	**6.6E-03**
Ammonia-N (mg/l) (Yearly)	0	3.94E+00	7.21E-01	na	--	5.6E+01	1.9E+01	na	--	9.85E-01	1.80E-01	na	--	1.4E+01	4.7E+00	na	--	**1.4E+01**	**4.7E+00**	na	--
Ammonia-N (mg/l) (High Flow)	0	3.90E+00	1.02E+00	na	--	2.4E+02	1.0E+02	na	--	9.74E-01	2.56E-01	na	--	6.1E+01	2.5E+01	na	--	**6.1E+01**	**2.5E+01**	na	--
Anthracene	0	--	--	na	4.0E+04	--	--	na	1.5E+06	--	--	na	4.0E+03	--	--	na	1.5E+05	--	--	na	**1.5E+05**
Antimony	0	--	--	na	6.4E+02	--	--	na	2.4E+04	--	--	na	6.4E+01	--	--	na	2.4E+03	--	--	na	**2.4E+03**
Arsenic	0	3.4E+02	1.5E+02	na	--	4.9E+03	2.7E+03	na	--	8.5E+01	3.8E+01	na	--	1.2E+03	6.6E+02	na	--	**1.2E+03**	**6.6E+02**	na	--
Barium	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Benzene [C]	0	--	--	na	5.1E+02	--	--	na	6.8E+04	--	--	na	5.1E+01	--	--	na	6.8E+03	--	--	na	**6.8E+03**
Benzidine[C]	0	--	--	na	2.0E-03	--	--	na	2.7E-01	--	--	na	2.0E-04	--	--	na	2.7E-02	--	--	na	**2.7E-02**
Benzo (a) anthracene [C]	0	--	--	na	1.8E-01	--	--	na	2.4E+01	--	--	na	1.8E-02	--	--	na	2.4E+00	--	--	na	**2.4E+00**
Benzo (b) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	2.4E+01	--	--	na	1.8E-02	--	--	na	2.4E+00	--	--	na	**2.4E+00**
Benzo (k) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	2.4E+01	--	--	na	1.8E-02	--	--	na	2.4E+00	--	--	na	**2.4E+00**
Benzo (a) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	2.4E+01	--	--	na	1.8E-02	--	--	na	2.4E+00	--	--	na	**2.4E+00**
Bis2-Chloroethyl Ether [C]	0	--	--	na	5.3E+00	--	--	na	7.0E+02	--	--	na	5.3E-01	--	--	na	7.0E+01	--	--	na	**7.0E+01**
Bis2-Chloroisopropyl Ether	0	--	--	na	6.5E+04	--	--	na	2.4E+06	--	--	na	6.5E+03	--	--	na	2.4E+05	--	--	na	**2.4E+05**
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	na	2.2E+01	--	--	na	2.9E+03	--	--	na	2.2E+00	--	--	na	2.9E+02	--	--	na	**2.9E+02**
Bromoform [C]	0	--	--	na	1.4E+03	--	--	na	1.9E+05	--	--	na	1.4E+02	--	--	na	1.9E+04	--	--	na	**1.9E+04**
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	7.2E+04	--	--	na	1.9E+02	--	--	na	7.2E+03	--	--	na	**7.2E+03**
Cadmium	0	8.2E-01	3.8E-01	na	--	1.2E+01	6.7E+00	na	--	2.1E-01	9.5E-02	na	--	2.9E+00	1.7E+00	na	--	**2.9E+00**	**1.7E+00**	na	--
Carbon Tetrachloride [C]	0	--	--	na	1.6E+01	--	--	na	2.1E+03	--	--	na	1.6E+00	--	--	na	2.1E+02	--	--	na	**2.1E+02**
Chlordane [C]	0	2.4E+00	4.3E-03	na	8.1E-03	3.4E+01	7.6E-02	na	1.1E+00	6.0E-01	1.1E-03	na	8.1E-04	8.6E+00	1.9E-02	na	1.1E-01	**8.6E+00**	**1.9E-02**	na	**1.1E-01**
Chloride	0	8.6E+05	2.3E+05	na	--	1.2E+07	4.1E+06	na	--	2.2E+05	5.8E+04	na	--	3.1E+06	1.0E+06	na	--	**3.1E+06**	**1.0E+06**	na	--
TRC	0	1.9E+01	1.1E+01	na	--	2.7E+02	1.9E+02	na	--	4.8E+00	2.8E+00	na	--	6.8E+01	4.9E+01	na	--	**6.8E+01**	**4.9E+01**	na	--
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	6.0E+04	--	--	na	1.6E+02	--	--	na	6.0E+03	--	--	na	**6.0E+03**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane[C]	0	--	--	na	1.3E+02	--	--	na	1.7E+04	--	--	na	1.3E+01	--	--	na	1.7E+03	--	--	na	**1.7E+03**
Chloroform	0	--	--	na	1.1E+04	--	--	na	4.1E+05	--	--	na	1.1E+03	--	--	na	4.1E+04	--	--	na	**4.1E+04**
2-Chloronaphthalene	0	--	--	na	1.6E+03	--	--	na	6.0E+04	--	--	na	1.6E+02	--	--	na	6.0E+03	--	--	na	**6.0E+03**
2-Chlorophenol	0	--	--	na	1.5E+02	--	--	na	5.7E+03	--	--	na	1.5E+01	--	--	na	5.7E+02	--	--	na	**5.7E+02**
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	1.2E+00	7.2E-01	na	--	2.1E-02	1.0E-02	na	--	3.0E-01	1.8E-01	na	--	**3.0E-01**	**1.8E-01**	na	--
Chromium III	0	1.8E+02	2.4E+01	na	--	2.6E+03	4.2E+02	na	--	4.6E+01	6.0E+00	na	--	6.6E+02	1.1E+02	na	--	**6.6E+02**	**1.1E+02**	na	--
Chromium VI	0	1.6E+01	1.1E+01	na	--	2.3E+02	1.9E+02	na	--	4.0E+00	2.8E+00	na	--	5.7E+01	4.9E+01	na	--	**5.7E+01**	**4.9E+01**	na	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	na	--	--	--	1.0E+01	--	--	--	3.8E+02	--	--	--	na	--
Chrysene [C]	0	--	--	na	1.8E-02	--	--	na	2.4E+00	--	--	na	1.8E-03	--	--	na	2.4E-01	--	--	na	**2.4E-01**
Copper	0	3.6E+00	2.7E+00	na	--	5.2E+01	4.8E+01	na	--	9.1E-01	6.8E-01	na	--	1.3E+01	1.2E+01	na	--	**1.3E+01**	**1.2E+01**	na	--
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	3.2E+02	9.2E+01	na	6.0E+05	5.5E+00	1.3E+00	na	1.6E+03	7.9E+01	2.3E+01	na	6.0E+04	**7.9E+01**	**2.3E+01**	na	**6.0E+04**
DDD [C]	0	--	--	na	3.1E-03	--	--	na	4.1E-01	--	--	na	3.1E-04	--	--	na	4.1E-02	--	--	na	**4.1E-02**
DDE [C]	0	--	--	na	2.2E-03	--	--	na	2.9E-01	--	--	na	2.2E-04	--	--	na	2.9E-02	--	--	na	**2.9E-02**
DDT [C]	0	1.1E+00	1.0E-03	na	2.2E-03	1.6E+01	1.8E-02	na	2.9E-01	2.8E-01	2.5E-04	na	2.2E-04	3.9E+00	4.4E-03	na	2.9E-02	**3.9E+00**	**4.4E-03**	na	**2.9E-02**
Demeton	0	--	1.0E-01	na	--	--	1.8E+00	na	--	--	2.5E-02	na	--	--	4.4E-01	na	--	--	**4.4E-01**	na	--
Diazinon	0	1.7E-01	1.7E-01	na	--	2.4E+00	3.0E+00	na	--	4.3E-02	4.3E-02	na	--	6.1E-01	7.5E-01	na	--	**6.1E-01**	**7.5E-01**	na	--
Dibenz(a,h)anthracene [C]	0	--	--	na	1.8E-01	--	--	na	2.4E+01	--	--	na	1.8E-02	--	--	na	2.4E+00	--	--	na	**2.4E+00**
1,2-Dichlorobenzene	0	--	--	na	1.3E+03	--	--	na	4.9E+04	--	--	na	1.3E+02	--	--	na	4.9E+03	--	--	na	**4.9E+03**
1,3-Dichlorobenzene	0	--	--	na	9.6E+02	--	--	na	3.6E+04	--	--	na	9.6E+01	--	--	na	3.6E+03	--	--	na	**3.6E+03**
1,4-Dichlorobenzene	0	--	--	na	1.9E+02	--	--	na	7.2E+03	--	--	na	1.9E+01	--	--	na	7.2E+02	--	--	na	**7.2E+02**
3,3-Dichlorobenzidine[C]	0	--	--	na	2.8E-01	--	--	na	3.7E+01	--	--	na	2.8E-02	--	--	na	3.7E+00	--	--	na	**3.7E+00**
Dichlorobromomethane [C]	0	--	--	na	1.7E+02	--	--	na	2.3E+04	--	--	na	1.7E+01	--	--	na	2.3E+03	--	--	na	**2.3E+03**
1,2-Dichloroethane [C]	0	--	--	na	3.7E+02	--	--	na	4.9E+04	--	--	na	3.7E+01	--	--	na	4.9E+03	--	--	na	**4.9E+03**
1,1-Dichloroethylene	0	--	--	na	7.1E+03	--	--	na	2.7E+05	--	--	na	7.1E+02	--	--	na	2.7E+04	--	--	na	**2.7E+04**
1,2-trans-dichloroethylene	0	--	--	na	1.0E+04	--	--	na	3.8E+05	--	--	na	1.0E+03	--	--	na	3.8E+04	--	--	na	**3.8E+04**
2,4-Dichlorophenol	0	--	--	na	2.9E+02	--	--	na	1.1E+04	--	--	na	2.9E+01	--	--	na	1.1E+03	--	--	na	**1.1E+03**
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
1,2-Dichloropropane[C]	0	--	--	na	1.5E+02	--	--	na	2.0E+04	--	--	na	1.5E+01	--	--	na	2.0E+03	--	--	na	**2.0E+03**
1,3-Dichloropropene [C]	0	--	--	na	2.1E+02	--	--	na	2.8E+04	--	--	na	2.1E+01	--	--	na	2.8E+03	--	--	na	**2.8E+03**
Dieldrin [C]	0	2.4E-01	5.6E-02	na	5.4E-04	3.4E+00	9.9E-01	na	7.2E-02	6.0E-02	1.4E-02	na	5.4E-05	8.6E-01	2.5E-01	na	7.2E-03	**8.6E-01**	**2.5E-01**	na	**7.2E-03**
Diethyl Phthalate	0	--	--	na	4.4E+04	--	--	na	1.7E+06	--	--	na	4.4E+03	--	--	na	1.7E+05	--	--	na	**1.7E+05**
2,4-Dimethylphenol	0	--	--	na	8.5E+02	--	--	na	3.2E+04	--	--	na	8.5E+01	--	--	na	3.2E+03	--	--	na	**3.2E+03**
Dimethyl Phthalate	0	--	--	na	1.1E+06	--	--	na	4.1E+07	--	--	na	1.1E+05	--	--	na	4.1E+06	--	--	na	**4.1E+06**
Di-n-Butyl Phthalate	0	--	--	na	4.5E+03	--	--	na	1.7E+05	--	--	na	4.5E+02	--	--	na	1.7E+04	--	--	na	**1.7E+04**
2,4 Dinitrophenol	0	--	--	na	5.3E+03	--	--	na	2.0E+05	--	--	na	5.3E+02	--	--	na	2.0E+04	--	--	na	**2.0E+04**
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2.8E+02	--	--	na	1.1E+04	--	--	na	2.8E+01	--	--	na	1.1E+03	--	--	na	**1.1E+03**
2,4-Dinitrotoluene [C]	0	--	--	na	3.4E+01	--	--	na	4.5E+03	--	--	na	3.4E+00	--	--	na	4.5E+02	--	--	na	**4.5E+02**
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	na	5.1E-08	--	--	na	1.9E-06	--	--	na	5.1E-09	--	--	na	1.9E-07	--	--	na	**1.9E-07**
1,2-Diphenylhydrazine[C]	0	--	--	na	2.0E+00	--	--	na	2.7E+02	--	--	na	2.0E-01	--	--	na	2.7E+01	--	--	na	**2.7E+01**
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	3.2E+00	9.9E-01	na	3.4E+03	5.5E-02	1.4E-02	na	8.9E+00	7.9E-01	2.5E-01	na	3.4E+02	**7.9E-01**	**2.5E-01**	na	**3.4E+02**
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	3.2E+00	9.9E-01	na	3.4E+03	5.5E-02	1.4E-02	na	8.9E+00	7.9E-01	2.5E-01	na	3.4E+02	**7.9E-01**	**2.5E-01**	na	**3.4E+02**
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	3.2E+00	9.9E-01	--	--	5.5E-02	1.4E-02	--	--	7.9E-01	2.5E-01	--	--	**7.9E-01**	**2.5E-01**	--	--
Endosulfan Sulfate	0	--	--	na	8.9E+01	--	--	na	3.4E+03	--	--	na	8.9E+00	--	--	na	3.4E+02	--	--	na	**3.4E+02**
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	1.2E+00	6.4E-01	na	2.3E+00	2.2E-02	9.0E-03	na	6.0E-03	3.1E-01	1.6E-01	na	2.3E-01	**3.1E-01**	**1.6E-01**	na	**2.3E-01**
Endrin Aldehyde	0	--	--	na	3.0E-01	--	--	na	1.1E+01	--	--	na	3.0E-02	--	--	na	1.1E+00	--	--	na	**1.1E+00**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	na	2.1E+03	--	--	na	7.9E+04	--	--	na	2.1E+02	--	--	na	7.9E+03	--	--	na	**7.9E+03**
Fluoranthene	0	--	--	na	1.4E+02	--	--	na	5.3E+03	--	--	na	1.4E+01	--	--	na	5.3E+02	--	--	na	**5.3E+02**
Fluorene	0	--	--	na	5.3E+03	--	--	na	2.0E+05	--	--	na	5.3E+02	--	--	na	2.0E+04	--	--	na	**2.0E+04**
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Guthion	0	--	1.0E-02	na	--	--	1.8E-01	na	--	--	2.5E-03	na	--	--	4.4E-02	na	--	--	**4.4E-02**	na	--
Heptachlor [c]	0	5.2E-01	3.8E-03	na	7.9E-04	7.5E+00	6.7E-02	na	1.0E-01	1.3E-01	9.5E-04	na	7.9E-05	1.9E+00	1.7E-02	na	1.0E-02	**1.9E+00**	**1.7E-02**	na	**1.0E-02**
Heptachlor Epoxide[c]	0	5.2E-01	3.8E-03	na	3.9E-04	7.5E+00	6.7E-02	na	5.2E-02	1.3E-01	9.5E-04	na	3.9E-05	1.9E+00	1.7E-02	na	5.2E-03	**1.9E+00**	**1.7E-02**	na	**5.2E-03**
Hexachlorobenzene[c]	0	--	--	na	2.9E-03	--	--	na	3.8E-01	--	--	na	2.9E-04	--	--	na	3.8E-02	--	--	na	**3.8E-02**
Hexachlorobutadiene[c]	0	--	--	na	1.8E+02	--	--	na	2.4E+04	--	--	na	1.8E+01	--	--	na	2.4E+03	--	--	na	**2.4E+03**
Hexachlorocyclohexane Alpha-BHC[c]	0	--	--	na	4.9E-02	--	--	na	6.5E+00	--	--	na	4.9E-03	--	--	na	6.5E-01	--	--	na	**6.5E-01**
Hexachlorocyclohexane Beta-BHC[c]	0	--	--	na	1.7E-01	--	--	na	2.3E+01	--	--	na	1.7E-02	--	--	na	2.3E+00	--	--	na	**2.3E+00**
Hexachlorocyclohexane Gamma-BHC[c] (Lindane)	0	9.5E-01	na	na	1.8E+00	1.4E+01	--	na	2.4E+02	2.4E-01	--	na	1.8E-01	3.4E+00	--	na	2.4E+01	**3.4E+00**	--	na	**2.4E+01**
Hexachlorocyclopentadiene	0	--	--	na	1.1E+03	--	--	na	4.1E+04	--	--	na	1.1E+02	--	--	na	4.1E+03	--	--	na	**4.1E+03**
Hexachloroethane[c]	0	--	--	na	3.3E+01	--	--	na	4.4E+03	--	--	na	3.3E+00	--	--	na	4.4E+02	--	--	na	**4.4E+02**
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	3.5E+01	na	--	--	5.0E-01	na	--	--	8.8E+00	na	--	--	**8.8E+00**	na	--
Indeno (1,2,3-cd) pyrene [c]	0	--	--	na	1.8E-01	--	--	na	2.4E+01	--	--	na	1.8E-02	--	--	na	2.4E+00	--	--	na	**2.4E+00**
Iron	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Isophorone[c]	0	--	--	na	9.6E+03	--	--	na	1.3E+06	--	--	na	9.6E+02	--	--	na	1.3E+05	--	--	na	**1.3E+05**
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	**0.0E+00**	na	--
Lead	0	2.0E+01	2.3E+00	na	--	2.9E+02	4.1E+01	na	--	5.1E+00	5.8E-01	na	--	7.3E+01	1.0E+01	na	--	**7.3E+01**	**1.0E+01**	na	--
Malathion	0	--	1.0E-01	na	--	--	1.8E+00	na	--	--	2.5E-02	na	--	--	4.4E-01	na	--	--	**4.4E-01**	na	--
Manganese	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Mercury	0	1.4E+00	7.7E-01	--	--	2.0E+01	1.4E+01	--	--	3.5E-01	1.9E-01	--	--	5.0E+00	3.4E+00	--	--	**5.0E+00**	**3.4E+00**	--	--
Methyl Bromide	0	--	--	na	1.5E+03	--	--	na	5.7E+04	--	--	na	1.5E+02	--	--	na	5.7E+03	--	--	na	**5.7E+03**
Methylene Chloride [c]	0	--	--	na	5.9E+03	--	--	na	7.8E+05	--	--	na	5.9E+02	--	--	na	7.8E+04	--	--	na	**7.8E+04**
Methoxychlor	0	--	3.0E-02	na	--	--	5.3E-01	na	--	--	7.5E-03	na	--	--	1.3E-01	na	--	--	**1.3E-01**	na	--
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	**0.0E+00**	na	--
Nickel	0	5.6E+01	6.3E+00	na	4.6E+03	8.1E+02	1.1E+02	na	1.7E+05	1.4E+01	1.6E+00	na	4.6E+02	2.0E+02	2.8E+01	na	1.7E+04	**2.0E+02**	**2.8E+01**	na	**1.7E+04**
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Nitrobenzene	0	--	--	na	6.9E+02	--	--	na	2.6E+04	--	--	na	6.9E+01	--	--	na	2.6E+03	--	--	na	**2.6E+03**
N-Nitrosodimethylamine[c]	0	--	--	na	3.0E+01	--	--	na	4.0E+03	--	--	na	3.0E+00	--	--	na	4.0E+02	--	--	na	**4.0E+02**
N-Nitrosodiphenylamine[c]	0	--	--	na	6.0E+01	--	--	na	8.0E+03	--	--	na	6.0E+00	--	--	na	8.0E+02	--	--	na	**8.0E+02**
N-Nitrosodi-n-propylamine[c]	0	--	--	na	5.1E+00	--	--	na	6.8E+02	--	--	na	5.1E-01	--	--	na	6.8E+01	--	--	na	**6.8E+01**
Nonylphenol	0	2.8E+01	6.6E+00	--	--	4.0E+02	1.2E+02	na	--	7.0E+00	1.7E+00	--	--	1.0E+02	2.9E+01	--	--	**1.0E+02**	**2.9E+01**	na	--
Parathion	0	6.5E-02	1.3E-02	na	--	9.3E-01	2.3E-01	na	--	1.6E-02	3.3E-03	na	--	2.3E-01	5.7E-02	na	--	**2.3E-01**	**5.7E-02**	na	--
PCB Total[c]	0	--	1.4E-02	na	6.4E-04	--	2.5E-01	na	8.5E-02	--	3.5E-03	na	6.4E-05	--	6.2E-02	na	8.5E-03	--	**6.2E-02**	na	**8.5E-03**
Pentachlorophenol [c]	0	7.1E+00	5.4E+00	na	3.0E+01	1.0E+02	9.6E+01	na	4.0E+03	1.8E+00	1.4E+00	na	3.0E+00	2.5E+01	2.4E+01	na	4.0E+02	**2.5E+01**	**2.4E+01**	na	**4.0E+02**
Phenol	0	--	--	na	8.6E+05	--	--	na	3.2E+07	--	--	na	8.6E+04	--	--	na	3.2E+06	--	--	na	**3.2E+06**
Pyrene	0	--	--	na	4.0E+03	--	--	na	1.5E+05	--	--	na	4.0E+02	--	--	na	1.5E+04	--	--	na	**1.5E+04**
Radionuclides	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Gross Alpha Activity (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Beta and Photon Activity (mrem/yr)	0	--	--	na	4.0E+00	--	--	na	1.5E+02	--	--	na	4.0E-01	--	--	na	1.5E+01	--	--	na	**1.5E+01**
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Uranium (ug/l)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	na	4.2E+03	2.9E+02	8.8E+01	na	1.6E+05	5.0E+00	1.3E+00	na	4.2E+02	7.2E+01	2.2E+01	na	1.6E+04	**7.2E+01**	**2.2E+01**	**na**	**1.6E+04**
Silver	0	3.2E-01	--	na	--	4.6E+00	--	na	--	7.9E-02	--	na	--	1.1E+00	--	na	--	**1.1E+00**	**--**	**na**	**--**
Sulfate	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	na	4.0E+01	--	--	na	5.3E+03	--	--	na	4.0E+00	--	--	na	5.3E+02	**--**	**--**	**na**	**5.3E+02**
Tetrachloroethylene[C]	0	--	--	na	3.3E+01	--	--	na	4.4E+03	--	--	na	3.3E+00	--	--	na	4.4E+02	**--**	**--**	**na**	**4.4E+02**
Thallium	0	--	--	na	4.7E-01	--	--	na	1.8E+01	--	--	na	4.7E-02	--	--	na	1.8E+00	**--**	**--**	**na**	**1.8E+00**
Toluene	0	--	--	na	6.0E+03	--	--	na	2.3E+05	--	--	na	6.0E+02	--	--	na	2.3E+04	**--**	**--**	**na**	**2.3E+04**
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Toxaphene [C]	0	7.3E-01	2.0E-04	na	2.8E-03	1.0E+01	3.5E-03	na	3.7E-01	1.8E-01	5.0E-05	na	2.8E-04	2.6E+00	8.8E-04	na	3.7E-02	**2.6E+00**	**8.8E-04**	**na**	**3.7E-02**
Tributyltin	0	4.6E-01	7.2E-02	na	--	6.6E+00	1.3E+00	na	--	1.2E-01	1.8E-02	na	--	1.6E+00	3.2E-01	na	--	**1.6E+00**	**3.2E-01**	**na**	**--**
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	2.6E+03	--	--	na	7.0E+00	--	--	na	2.6E+02	**--**	**--**	**na**	**2.6E+02**
1,1,2-Trichloroethane[C]	0	--	--	na	1.6E+02	--	--	na	2.1E+04	--	--	na	1.6E+01	--	--	na	2.1E+03	**--**	**--**	**na**	**2.1E+03**
Trichloroethylene [C]	0	--	--	na	3.0E+02	--	--	na	4.0E+04	--	--	na	3.0E+01	--	--	na	4.0E+03	**--**	**--**	**na**	**4.0E+03**
2,4,6-Trichlorophenol [C]	0	--	--	na	2.4E+01	--	--	na	3.2E+03	--	--	na	2.4E+00	--	--	na	3.2E+02	**--**	**--**	**na**	**3.2E+02**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Vinyl Chloride[C]	0	--	--	na	2.4E+01	--	--	na	3.2E+03	--	--	na	2.4E+00	--	--	na	3.2E+02	**--**	**--**	**na**	**3.2E+02**
Zinc	0	3.6E+01	3.6E+01	na	2.6E+04	5.2E+02	6.4E+02	na	9.8E+05	9.1E+00	9.1E+00	na	2.6E+03	1.3E+02	1.6E+02	na	9.8E+04	**1.3E+02**	**1.6E+02**	**na**	**9.8E+04**

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
   Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	2.4E+03
Arsenic	4.0E+02
Barium	na
Cadmium	1.0E+00
Chromium III	6.3E+01
Chromium VI	2.3E+01
Copper	5.2E+00
Iron	na
Lead	6.1E+00
Manganese	na
Mercury	2.0E+00
Nickel	1.7E+01
Selenium	1.3E+01
Silver	4.6E-01
Zinc	5.2E+01

Note: do not use QL's lower than the minimum QL's provided in agency guidance

0.006 MGD DISCHARGE FLOW - STREAM MIX PER "Mix.exe"

Discharge Flow Used for WQS-WLA Calculations (MGD 0.006

	Stream Flows Allocated to Mix (MGD)		Total Mix Flows Stream + Discharge (MGD)	
	Dry Season	Wet Season	Dry Season	Wet Season
1Q10	0.080	0.370	0.086	0.376
7Q10	0.100	N/A	0.106	N/A
30Q10	0.150	0.590	0.156	0.596
30Q5	0.220	N/A	0.226	N/A
Harm. Mean	0.790	N/A	0.796	N/A
Annual Avg.	0.000	N/A	0.006	N/A

Stream/Discharge Mix Values

	Dry Season	Wet Season
1Q10 90th% Temp. Mix (deg C)	23.698	18.162
30Q10 90th% Temp. Mix (deg C)	23.654	18.139
1Q10 90th% pH Mix (SU)	8.392	8.398
30Q10 90th% pH Mix (SU)	8.396	8.399
1Q10 10th% pH Mix (SU)	6.792	N/A
7Q10 10th% pH Mix (SU)	6.794	N/A

	Calculated	Formula Inputs
1Q10 Hardness (mg/L as CaCO3)	25.0	25.0
7Q10 Hardness (mg/L as CaCO3)	25.0	25.0

Ammonia - Dry Season - Acute

90th Percentile pH (SU)	8.392
(7.204 - pH)	-1.188
(pH - 7.204)	1.188
Trout Present Criterion (mg N/l	2.633
Trout Absent Criterion (mg N/L	3.942
Trout Present?	n
Effective Criterion (mg N/L)	3.942

Ammonia - Dry Season - Chronic

90th Percentile Temp. (deg C)	23.654
90th Percentile pH (SU)	8.396
MIN	1.581
MAX	23.654
(7.688 - pH)	-0.708
(pH - 7.688)	0.708
Early LS Present Criterion (mg N	0.721
Early LS Absent Criterion (mg N/	0.721
Early Life Stages Present?	y
Effective Criterion (mg N/L)	0.721

Ammonia - Wet Season - Acute

90th Percentile pH (SU)	8.398
(7.204 - pH)	-1.194
(pH - 7.204)	1.194
Trout Present Criterion (mg N/l	2.602
Trout Absent Criterion (mg N/L	3.896
Trout Present?	n
Effective Criterion (mg N/L)	3.896

Ammonia - Wet Season - Chronic

90th Percentile Temp. (deg C)	18.139
90th Percentile pH (SU)	8.399
MIN	2.257
MAX	18.139
(7.688 - pH)	-0.711
(pH - 7.688)	0.711
Early LS Present Criterion (mg N	1.023
Early LS Absent Criterion (mg N/	1.023
Early Life Stages Present?	y
Effective Criterion (mg N/L)	1.023

0.006 MGD DISCHARGE FLOW - COMPLETE STREAM MIX

Discharge Flow Used for WQS-WLA Calculations (MGD 0.006

	100% Stream Flows Allocated to Mix (MGD)		Total Mix Flows Stream + Discharge (MGD)	
	Dry Season	Wet Season	Dry Season	Wet Season
1Q10	0.080	0.370	0.086	0.376
7Q10	0.100	N/A	0.106	N/A
30Q10	0.150	0.590	0.156	0.596
30Q5	0.220	N/A	0.226	N/A
Harm. Mean	0.790	N/A	0.796	N/A
Annual Avg.	0.000	N/A	0.006	N/A

Stream/Discharge Mix Values

	Dry Season	Wet Season
1Q10 90th% Temp. Mix (deg C)	23.698	18.162
30Q10 90th% Temp. Mix (deg C)	23.654	18.139
1Q10 90th% pH Mix (SU)	8.392	8.398
30Q10 90th% pH Mix (SU)	8.396	8.399
1Q10 10th% pH Mix (SU)	6.792	N/A
7Q10 10th% pH Mix (SU)	6.794	N/A

	Calculated	Formula Inputs
1Q10 Hardness (mg/L as CaCO3) =	25.000	25.000
7Q10 Hardness (mg/L as CaCO3) =	25.000	25.000

Ammonia - Dry Season - Acute

90th Percentile pH (SU)	8.392
(7.204 - pH)	-1.188
(pH - 7.204)	1.188
Trout Present Criterion (mg N/l	2.633
Trout Absent Criterion (mg N/L	3.942
Trout Present?	n
Effective Criterion (mg N/L)	3.942

Ammonia - Dry Season - Chronic

90th Percentile Temp. (deg C)	23.654
90th Percentile pH (SU)	8.396
MIN	1.581
MAX	23.654
(7.688 - pH)	-0.708
(pH - 7.688)	0.708
Early LS Present Criterion (mg N	0.721
Early LS Absent Criterion (mg N/	0.721
Early Life Stages Present?	y
Effective Criterion (mg N/L)	0.721

Ammonia - Wet Season - Acute

90th Percentile pH (SU)	8.398
(7.204 - pH)	-1.194
(pH - 7.204)	1.194
Trout Present Criterion (mg N/l	2.602
Trout Absent Criterion (mg N/L	3.896
Trout Present?	n
Effective Criterion (mg N/L)	3.896

Ammonia - Wet Season - Chronic

90th Percentile Temp. (deg C)	18.139
90th Percentile pH (SU)	8.399
MIN	2.257
MAX	18.139
(7.688 - pH)	-0.711
(pH - 7.688)	0.711
Early LS Present Criterion (mg N	1.023
Early LS Absent Criterion (mg N/	1.023
Early Life Stages Present?	y
Effective Criterion (mg N/L)	1.023

10/8/2015 3:28:22 PM

Facility = Windy Gap Elementary School WWTP
Chemical = ammonia mg/L (Jan. - May)
Chronic averaging period = 30
WLAa = 61
WLAc = 25
Q.L. = 0.2
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average= 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

9

10/8/2015 3:29:05 PM

Facility = Windy Gap Elementary School WWTP
Chemical = ammonia mg/L (June - Dec.)
Chronic averaging period = 30
WLAa = 14
WLAc = 4.7
Q.L. = 0.2
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average= 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 9.48304943905666
Average Weekly limit = 9.48304943905666
Average Monthly LImit = 9.48304943905666

The data are:

9

10/8/2015 3:30:28 PM

Facility = Windy Gap Elementary School WWTP
Chemical = TRC (mg/L)
Chronic averaging period = 4
WLAa = 0.068
WLAc = 0.049
Q.L. = 0.2
# samples/mo. = 30
# samples/wk. = 8

Summary of Statistics:

observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average= 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 0.068
Average Weekly limit = 4.05623458413511E-02
Average Monthly LImit = 3.37022391430022E-02

The data are:

9

Attachment H

Regional Water Quality Model (Version 4.0)

REGIONAL MODELING SYSTEM VERSION 4.0

Model Input File for the Discharge to GILLS CREEK, NORTH FORK.

File Information

File Name:	C:\Users\pmp94864\Documents\Working files\BECKY\PERMITS\VPDES\W
Date Modified:	December 08, 2015

Water Quality Standards Information

Stream Name:	GILLS CREEK, NORTH FORK
River Basin:	Roanoke River Basin
Section:	6a
Class:	III - Nontidal Waters (Coastal and Piedmont)
Special Standards:	NEW-1

Background Flow Information

Gauge Used:	Flow Frequency
Gauge Drainage Area:	21.85 Sq.Mi.
Gauge 7Q10 Flow:	1.03 MGD
Headwater Drainage Area:	2.95 Sq.Mi.
Headwater 7Q10 Flow:	0.1390618 MGD (Net; includes Withdrawals/Discharges)
Withdrawal/Discharges:	0 MGD
Incremental Flow in Segments:	4.713959E-02 MGD/Sq.Mi.

Background Water Quality

Background Temperature:	23.6 Degrees C
Background cBOD5:	2 mg/l
Background TKN:	0 mg/l
Background D.O.:	7.398453 mg/l

Model Segmentation

Number of Segments:	1
Model Start Elevation:	1040 ft above MSL
Model End Elevation:	1020 ft above MSL

REGIONAL MODELING SYSTEM VERSION 4.0
Model Input File for the Discharge to GILLS CREEK, NORTH FORK.

Segment Information for Segment 1

Definition Information

Segment Definition:	A discharge enters.
Discharge Name:	WINDY GAP ELEMENTARY SCHOOL WWTP
VPDES Permit No.:	VA0090719

Discharger Flow Information

Flow:	0.006 MGD
cBOD5:	30 mg/l
TKN:	20 mg/l
D.O.:	5 mg/l
Temperature:	25 Degrees C

Geographic Information

Segment Length:	0.189 miles
Upstream Drainage Area:	1040 Sq.Mi.
Downstream Drainage Area:	0 Sq.Mi.
Upstream Elevation:	1040 Ft.
Downstream Elevation:	1020 Ft.

Hydraulic Information

Segment Width:	2.04 Ft.
Segment Depth:	0.214 Ft.
Segment Velocity:	0.511 Ft./Sec.
Segment Flow:	0.145 MGD
Incremental Flow:	-49.025 MGD (Applied at end of segment.)

Channel Information

Cross Section:	Rectangular
Character:	Moderately Meandering
Pool and Riffle:	No
Bottom Type:	Small Rock
Sludge:	None
Plants:	None
Algae:	None

"Model Run For C:\Users\pmp94864\Documents\Working files\BECKY\PERMITS\VPDES\Windy Gap Elementary School WWTP\Reissuance 2016\Data\Windy Gap ES Model 2016 change.mod On 12/8/2015 10:03:50 AM"

"Model is for GILLS CREEK, NORTH FORK."
"Model starts at the WINDY GAP ELEMENTARY SCHOOL WWTP discharge."

"Background Data"

"7Q10"	"cBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.1391,	2,	0,	7.398,	23.6

"Discharge/Tributary Input Data for Segment 1"

"Flow"	"cBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.006,	30,	20,	,5,	25

"Hydraulic Information for Segment 1"

"Length"	"Width"	"Depth"	"Velocity"
"(mi)"	"(ft)"	"(ft)"	"(ft/sec)"
.189,	2.04,	.214,	.511

"Initial Mix Values for Segment 1"

"Flow"	"DO"	"cBOD"	"nBOD"	"DOSat"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.1451,	7.299,	7.895,	3.045,	8.215,	23.65791

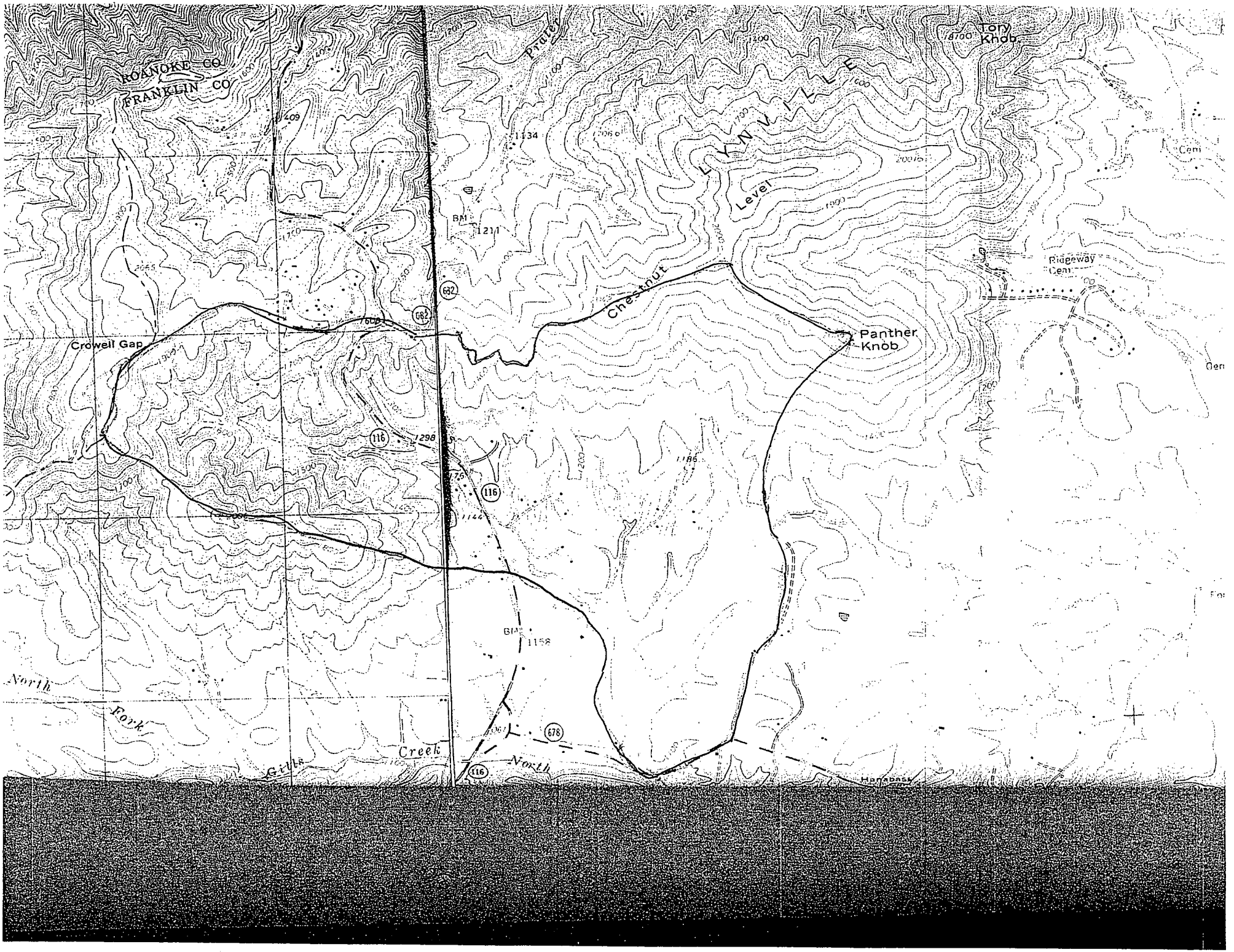
"Rate Constants for Segment 1. - (All units Per Day)"

"k1"	"k1@T"	"k2"	"k2@T"	"kn"	"kn@T"	"BD"	"BD@T"
1,	1.183,	20,	21.813,	.45,	.596,	0,	0

"Output for Segment 1"
"Segment starts at WINDY GAP ELEMENTARY SCHOOL WWTP"

"Total" "Dist."	"Segm." "Dist."	"DO"	"cBOD"	"nBOD"
"(mi)"	"(mi)"	"(mg/l)"	"(mg/l)"	"(mg/l)"
0,	0,	7.299,	7.895,	3.045
.1,	.1,	7.393,	7.784,	3.023
.189,	.189,	7.394,	7.687,	3.004

"END OF FILE"


ROANOKE CO.
FRANKLIN CO.
Tory Knob
LYNVILLE
Level
Chestnut
Ridgeway Cem.
Panther Knob
Crowell Gap
682
116
678
North Fork Gills Creek
North

North Carolina Division of Water Quality – Stream Identification Form; Version 3.1

Date: 1/19/07	Project: Windy Gap ES school	Latitude:
Evaluator: Becky France Jay Privette	Site: Windy Gap	Longitude:
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30* 39	County: Franklin	Other *e.g. Quad Name:* Hardy

A. Geomorphology (Subtotal = 27)	Absent	Weak	Moderate	Strong
1[a]. Continuous bed and bank	0	1	2	(3)
2. Sinuosity	0	1	(2)	3
3. In-channel structure: riffle-pool sequence	0	1	2	(3)
4. Soil texture or stream substrate sorting	0	1	2	(3)
5. Active/relic floodplain	0	1	2	(3)
6. Depositional bars or benches	0	1	2	(3)
7. Braided channel	0	(1)	2	3
8. Recent alluvial deposits	0	1	2	(3)
9[a] Natural levees	0	(1)	2	3
10. Headcuts	(0)	1	2	3
11. Grade controls	0	(0.5)	1	1.5
12. Natural valley or drainageway	0	0.5	1	(1.5)
13. Second or greater order channel on existing USGS or NRCS map or other documented evidence.	No = 0		Yes = (3)	

[a] Man-made ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 5)				
14. Groundwater flow/discharge	(0)	1	2	3
15. Water in channel and > 48 hrs since rain, or Water in channel – dry or growing season	0	1	2	(3)
16. Leaflitter	(1.5)	1	0.5	0
17. Sediment on plants or debris	(0)	0.5	1	1.5
18. Organic debris lines or piles (Wrack lines)	0	(0.5)	1	1.5
19. Hydric soils (redoximorphic features) present?	(No = 0)		Yes = 1.5	

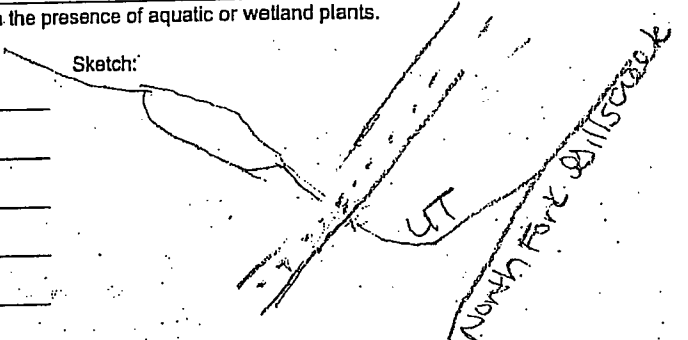
C. Biology (Subtotal = 7)				
20[b]. Fibrous roots in channel	(3)	2	1	0
21[b]. Rooted plants in channel	(3)	2	1	0
22. Crayfish	(0)	0.5	1	1.5
23. Bivalves	(0)	1	2	3
24. Fish	(0)	0.5	1	1.5
25. Amphibians	(0)	0.5	1	1.5
26. Macrobenthos (note diversity and abundance)	0	0.5	(1)	1.5
27. Filamentous algae; periphyton	(0)	1	2	3
28. Iron oxidizing bacteria/fungus.	(0)	0.5	1	1.5
29[b]. Wetland plants in streambed	FAC = 0.5; FACW = 0.75; OBL = 1.5 SAV = 2.0; Other = (0)			

[b] Items 20 and 21 focus on the presence of upland plants, Item 29 focuses on the presence of aquatic or wetland plants.

Notes: (use back side of this form for additional notes.)

Sediment clogged stream
40% riffles 5 riffles / 200 ft.
60% pool
6" discharge pipe
Steve Dakard Frank Caldwell at site visit

Sketch:



Attachment I

Reduced Monitoring Evaluation Memorandum

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Blue Ridge Regional Office

3019 Peters Creek Road Roanoke, VA 24019

SUBJECT: Justification for Reduced Monitoring Frequency
Reissuance of VPDES Permit No. VA0090719
Windy Gap Elementary School WWTP

TO: Permit File

FROM: Becky L. France, Water Permit Writer BLF

DATE: December 3, 2015

Compliance History

The VPDES Permit Manual recommends effluent monitoring frequencies. Guidance Memo 98-2005 allows for reduced monitoring at facilities with excellent compliance histories. For this reissuance, the eligibility for reduced monitoring has been evaluated.

To qualify for consideration of reduced monitoring, the facility should not have been issued any Letter of Noncompliance (LON), Notice of Violation (NOV), Warning Letter or be under any Consent Orders, Consent Decrees, Executive Compliance Agreements, or related enforcement documents during the past three years. The facility received a Warning Letter (W2013-03-W-1005) for exceedance of the ammonia limit in January 2013. During the time the ammonia sample was collected the effluent temperature had fallen to 7 ^{0}C. Nitrification would not be expected below 10 ^{0}C. So, this value does not represent an excursion from the expected performance from the treatment plant. The exceedance is due to the weather and beyond the control of the permittee. Additionally, these conditions were short term and the ammonia limit was based upon chronic conditions. With the exception of this weather related exceedance there have been no other exceedances of the ammonia limit from October 2009 through October 2015. Within the limits of the treatment technology, it is believed that the permittee has operated the plant in an exemplary manner and the one exceedance was not within their control. Therefore, this facility qualifies for evaluation of reduced monitoring.

Monitoring Data Evaluation

Discharge Monitoring Report (DMR) data for total suspended solids (TSS), biochemical oxygen demand (BOD_5), and dissolved oxygen (DO) from December 2013 through October 2015 were reviewed and tabulated in the attached tables and these parameters have been considered for reduced monitoring. *E. coli* limits are not considered eligible for reduced monitoring to ensure protection of aquatic life and human health. The pH limits are not eligible for reduced monitoring because of the periodic alkalinity adjustments required for the nitrification process. The ammonia limit for June – December was not considered for reduced monitoring due to the short duration of the limit. Since the ammonia limit for January – May cannot be removed due to backsliding restrictions but the statistical evaluation indicates it is no longer needed, the monitoring frequency

has been reduced to 1/3 months to verify compliance with the limit. The actual performance to permit limit ratios are summarized in the table that follows. Facilities with baseline monitoring that have an actual performance to permit limit ratio of greater than 75 percent are not eligible for reduced monitoring.

Table 1 **Performance to Permit Limit Ratios (DMR Data)**

Parameter	Actual Performance/ Permit Limit Monthly Average*	Actual Performance/ Permit Limit (Maximum)*	Reduced Monitoring
TSS	5.9%, 1.5%	3.9%, 1.0%	1/6 Months
BOD_5	1.0%, 0.2%	0.6%, 1.0%	1/6 Months

*The ratio based upon concentration is listed first, and the ratio based upon loading is listed second.

TSS: The DMR data are consistently well below the permit limits. According to Guidance Memo 98-2005, facilities with monthly baseline monitoring that have an actual performance to permit limit ratio of less than 25 percent are eligible for a reduced monitoring frequency of 1/6 months. A reduced monitoring frequency of 1/ 6 months for TSS has been included in the permit.

BOD_5: The BOD_5 limits are consistently well below the permit limits. According to Guidance Memo 98-2005, facilities with monthly baseline monitoring that have an actual performance to permit limit ratio of less than 25 percent are eligible for a reduced monitoring frequency of 1/6 months. A reduced monitoring frequency of 1/6 months for TSS has been included in the permit.

DO: The DO was within 0.5 mg/L of the minimum limit of 5.0 mg/L. Therefore, the facility does not qualify for a reduction in DO monitoring frequency.

The permit will contain a special condition that will revert the TSS and BOD_5 monitoring frequencies back to 1/discharge-month and if the permittee should be issued a Warning Letter or be the subject of an active enforcement action.

Table 2

Month Due	Flow average MGD	TSS				BOD_5			
		average kg/d	max kg/d	average mg/L	max mg/L	average kg/d	max kg/d	average mg/L	max mg/L
10-Dec-12	0.0016	53	53	9.3	9.3	<QL	<QL	<QL	<QL
10-Jan-13	0.0015	34	34	6.1	6.1	34	34	5.8	5.8
10-Feb-13	0.0016	67	67	11.8	11.8	19	19	3.4	3.4
10-Mar-13	0.0018	28	28	5	5	<QL	<QL	<QL	<QL
10-Apr-13	0.0018	19.3	19.3	3.4	3.4	<QL	<QL	<QL	<QL
10-May-13	0.0017	<QL	<QL	<QL	<QL	<QL	<QL	<QL	<QL
10-Jun-13	0.0018	<QL	<QL	<QL	<QL	<QL	<QL	<QL	<QL
10-Jul-13	0.0015	<QL	<QL	<QL	<QL	<QL	<QL	<QL	<QL
10-Sep-13	0.0017	22	22	3.9	3.9	<QL	<QL	<QL	<QL
10-Oct-13	0.0018	<QL	<QL	<QL	<QL	<QL	<QL	<QL	<QL
10-Nov-13	0.0018	<QL	<QL	<QL	<QL	<QL	<QL	<QL	<QL
10-Dec-13	0.0034	6	6	1	1	<QL	<QL	<QL	<QL
10-Jan-14	0.0017	<QL	<QL	<QL	<QL	<QL	<QL	<QL	<QL
10-Feb-14	0.0017	<QL	<QL	<QL	<QL	<QL	<QL	<QL	<QL
10-Mar-14	0.0018	<QL	<QL	<QL	<QL	<QL	<QL	<QL	<QL
10-Apr-14	0.0019	<QL	<QL	<QL	<QL	<QL	<QL	<QL	<QL
10-May-14	0.0018	<QL	<QL	<QL	<QL	<QL	<QL	<QL	<QL
10-Jun-14	0.0018	<QL	<QL	<QL	<QL	<QL	<QL	<QL	<QL
10-Aug-14	0.006	<QL	<QL	<QL	<QL	<QL	<QL	<QL	<QL
10-Sep-14	0.0018	<QL	<QL	<QL	<QL	<QL	<QL	<QL	<QL
10-Oct-14	0.0018	<QL	<QL	<QL	<QL	<QL	<QL	<QL	<QL
10-Nov-14	0.0018	<QL	<QL	<QL	<QL	<QL	<QL	<QL	<QL
10-Dec-14	0.0018	<QL	<QL	<QL	<QL	<QL	<QL	<QL	<QL
10-Jan-15	0.0017	<QL	<QL	<QL	<QL	<QL	<QL	<QL	<QL
10-Feb-15	0.0018	<QL	<QL	<QL	<QL	<QL	<QL	<QL	<QL
10-Mar-15	0.0017	<QL	<QL	<QL	<QL	<QL	<QL	<QL	<QL
10-Apr-15	0.0018	34	34	6	6	<QL	<QL	<QL	<QL
10-May-15	0.0018	40	40	7	7	<QL	<QL	<QL	<QL
10-Jun-15	0.0018	17	17	3	3	<QL	<QL	<QL	<QL
10-Sep-15	0.0017	<QL	<QL	<QL	<QL	<QL	<QL	<QL	<QL
10-Oct-15	0.0019	<QL	<QL	<QL	<QL	<QL	<QL	<QL	<QL
10-Nov-15	0.002	<QL	<QL	<QL	<QL	<QL	<QL	<QL	<QL
mean	0.0019	10	10	2	2	2	2	0.29	0.29
maximum	0.0060	67	67	12	12	34	34	6	6
minimum	0.0015	<QL	<QL	<QL	<QL	<QL	<QL	<QL	<QL
permit limit	0.006	680	1000	*30*	*45*	680	1000	30	45
(mean performance / permit limit) * 100	-	1.5	1.0	5.9	3.9	0.2	0.2	1.0	0.6

Table 3

Month Due	DO (mg/L)
10-Dec-12	5.1
10-Jan-13	5.0
10-Feb-13	5.1
10-Mar-13	5.2
10-Apr-13	5.3
10-May-13	5.1
10-Jun-13	5.5
10-Jul-13	5.6
10-Sep-13	5.2
10-Oct-13	5.3
10-Nov-13	5.1
10-Dec-13	5.3
10-Jan-14	5.8
10-Feb-14	5.9
10-Mar-14	5.9
10-Apr-14	5.9
10-May-14	5.8
10-Jun-14	6.5
10-Aug-14	7.6
10-Sep-14	6.0
10-Oct-14	6.1
10-Nov-14	6.1
10-Dec-14	6.3
10-Jan-15	6.1
10-Feb-15	6.3
10-Mar-15	6.3
10-Apr-15	6.3
10-May-15	6.3
10-Jun-15	6.2
10-Sep-15	6.3
10-Oct-15	6.1
10-Nov-15	6.1
maximum	7.6
minimum	5.0
permit limit	5.0

Table 4

Month Due	pH			
	min S.U.	H ion conc	max S.U.	H ion conc
10-Dec-12	7.1	7.943E-08	7.5	3.162E-08
10-Jan-13	7.3	5.012E-08	7.5	3.162E-08
10-Feb-13	7.2	6.310E-08	7.7	1.995E-08
10-Mar-13	7	1.000E-07	7.6	2.512E-08
10-Apr-13	7	1.000E-07	7.5	3.162E-08
10-May-13	7.3	5.012E-08	8.3	5.012E-09
10-Jun-13	7.2	6.310E-08	7.6	2.512E-08
10-Jul-13	7.4	3.981E-08	7.8	1.585E-08
10-Sep-13	6.7	1.995E-07	8.7	1.995E-09
10-Oct-13	7.2	6.310E-08	7.7	1.995E-08
10-Nov-13	7.3	5.012E-08	7.7	1.995E-08
10-Dec-13	6.5	3.162E-07	7.8	1.585E-08
10-Jan-14	7.2	6.310E-08	8.1	7.943E-09
10-Feb-14	6.9	1.259E-07	8.6	2.512E-09
10-Mar-14	7.1	7.943E-08	8.5	3.162E-09
10-Apr-14	7	1.000E-07	7.5	3.162E-08
10-May-14	7	1.000E-07	7.7	1.995E-08
10-Jun-14	6.6	2.512E-07	7.5	3.162E-08
10-Aug-14	7.5	3.162E-08	7.5	3.162E-08
10-Sep-14	6.7	1.995E-07	7.9	1.259E-08
10-Oct-14	7.2	6.310E-08	7.8	1.585E-08
10-Nov-14	7.1	7.943E-08	7.7	1.995E-08
10-Dec-14	7.2	6.310E-08	7.5	3.162E-08
10-Jan-15	7	1.000E-07	7.6	2.512E-08
10-Feb-15	7	1.000E-07	7.9	1.259E-08
10-Mar-15	7	1.000E-07	7.6	2.512E-08
10-Apr-15	7.1	7.943E-08	7.8	1.585E-08
10-May-15	7.1	7.943E-08	7.6	2.512E-08
10-Jun-15	7.2	6.310E-08	7.6	2.512E-08
10-Sep-15	7	1.000E-07	7.9	1.259E-08
10-Oct-15	7	1.000E-07	7.8	1.585E-08
10-Nov-15	7	1.000E-07	7.7	1.995E-08
mean	7.0	9.848E-08	7.7	1.967E-08
maximum			8.7	
minimum	6.5			
permit limit	6.0		9.0	

Attachment J

Public Notice

PUBLIC NOTICE – Environmental Permit

PURPOSE OF NOTICE: To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of treated wastewater into a water body in Franklin County, Virginia
PUBLIC COMMENT PERIOD: January 9, 2016 – February 8, 2016
PERMIT NAME: Virginia Pollutant Discharge Elimination System Permit – Wastewater issued by DEQ, under the authority of the State Water Control Board
APPLICANT NAME, ADDRESS, AND PERMIT NUMBER: Franklin County School Board, 250 School Service Road, Rocky Mount, Virginia 24151, VA0090719
FACILITY NAME AND LOCATION: Windy Gap Elementary School WWTP, 465 Truman Hill Road, Hardy, Virginia
PROJECT DESCRIPTION: The Franklin County School Board has applied for a reissuance of a permit for the public wastewater treatment plant. The applicant proposes to release treated sewage wastewater at a rate of 6,000 gallons per day from the current facility into a water body. The facility proposes to release the treated sewage into an unnamed tributary to the North Fork of Gills Creek in Franklin County in the Gills Creek Watershed (VAW-L11R). A watershed is the land area drained by a river and its incoming streams. The permit will limit the following pollutants to amounts that protect water quality: organic matter, solids, toxic pollutants.
HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING: DEQ accepts comments and requests for public hearing by e-mail, fax, or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for a public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requestor, including how and extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if a public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit.
CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS, AND ADDITIONAL INFORMATION: Becky L. France; ADDRESS: Virginia Department of Environmental Quality, Blue Ridge Regional Office, 3019 Peters Creek Road, Roanoke, VA 24019-2738; (540) 562-6700; E-MAIL ADDRESS: becky.france@deq.virginia.gov; FAX: (540) 562-6725. The public may review the draft permit and application at the DEQ office named above by appointment or may request copies of the documents from the contact person listed above.